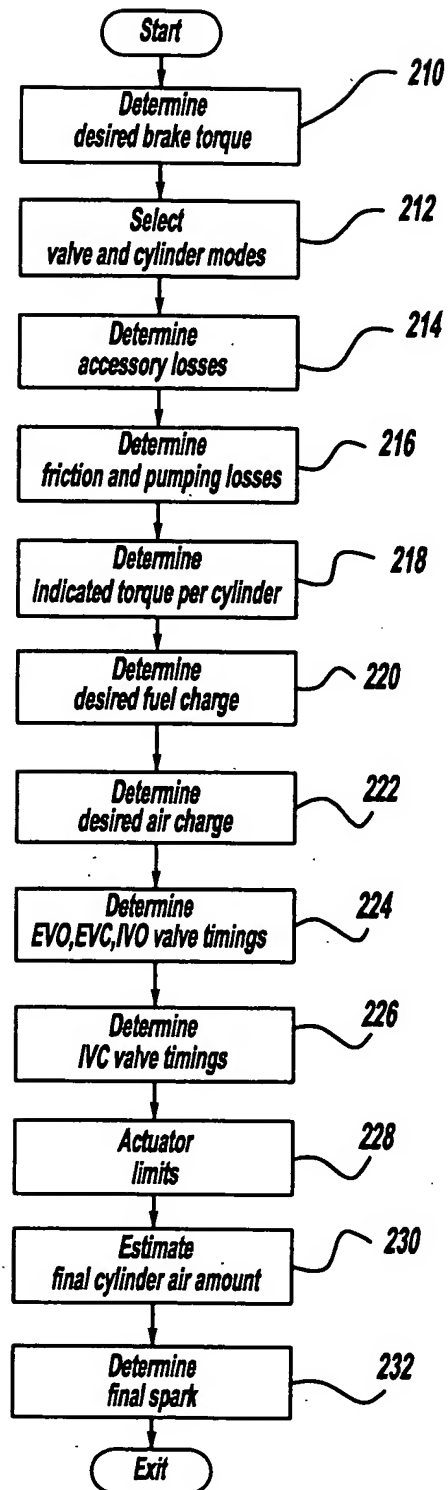
**FIG-1**

**FIG - 2**

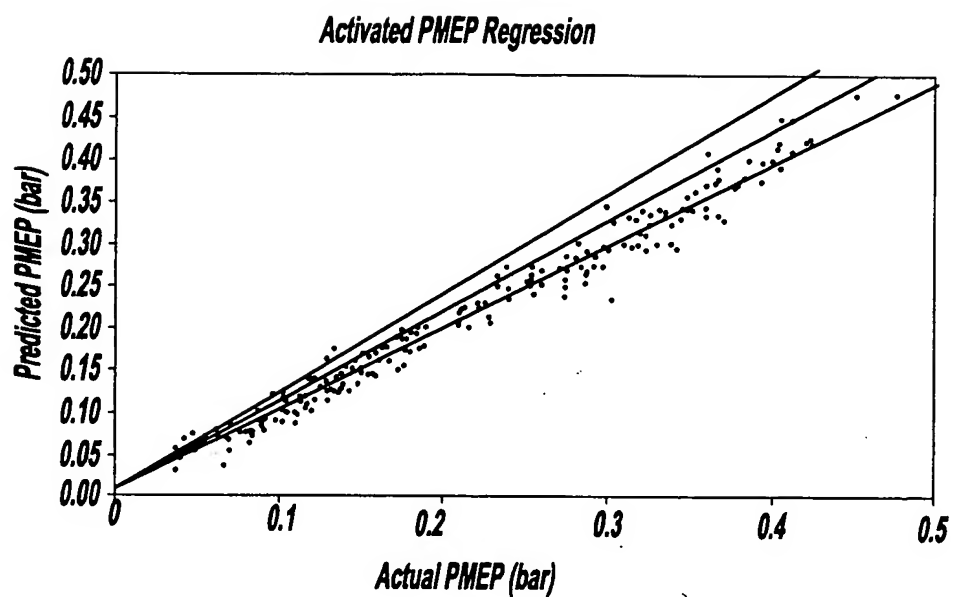


FIG - 3

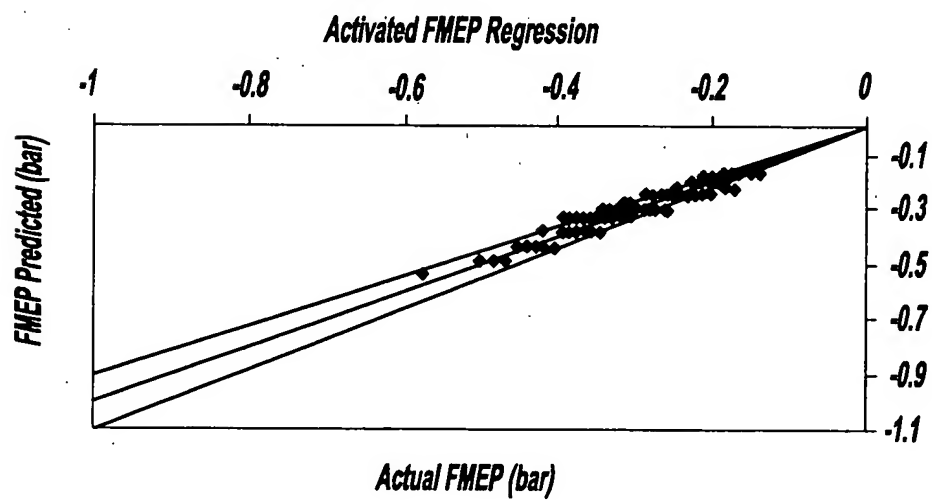


FIG - 4

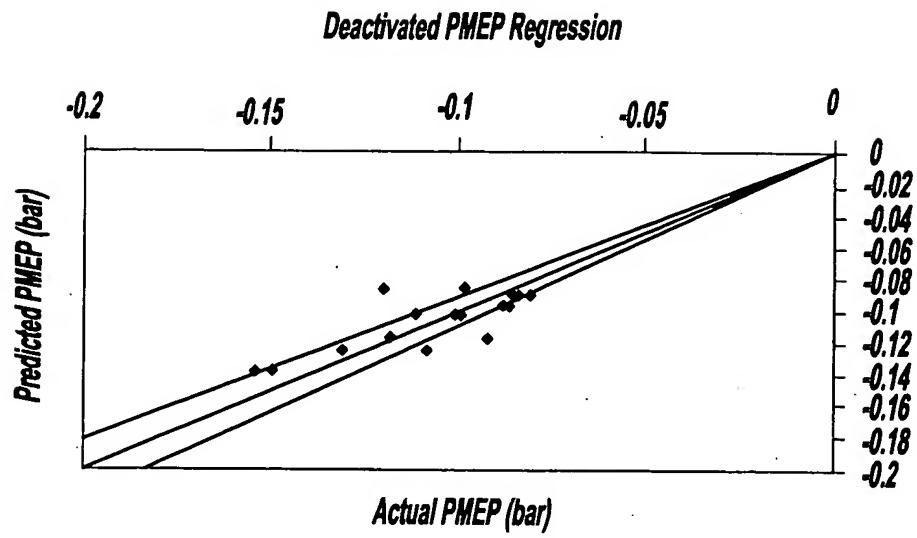


FIG - 5

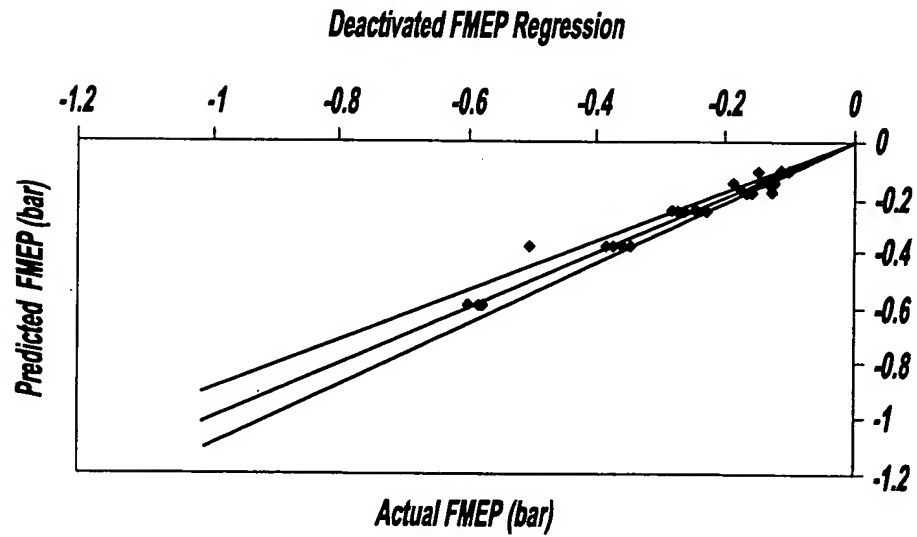
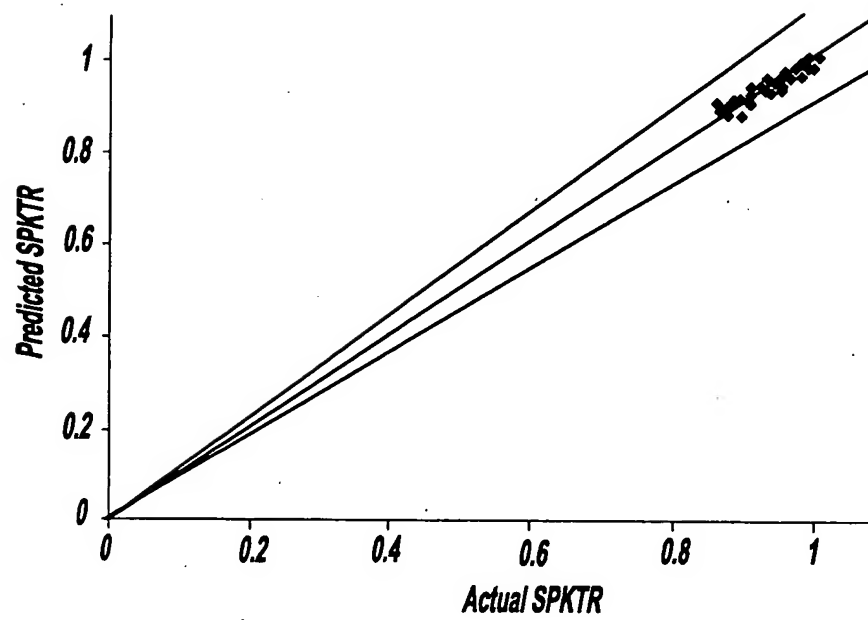
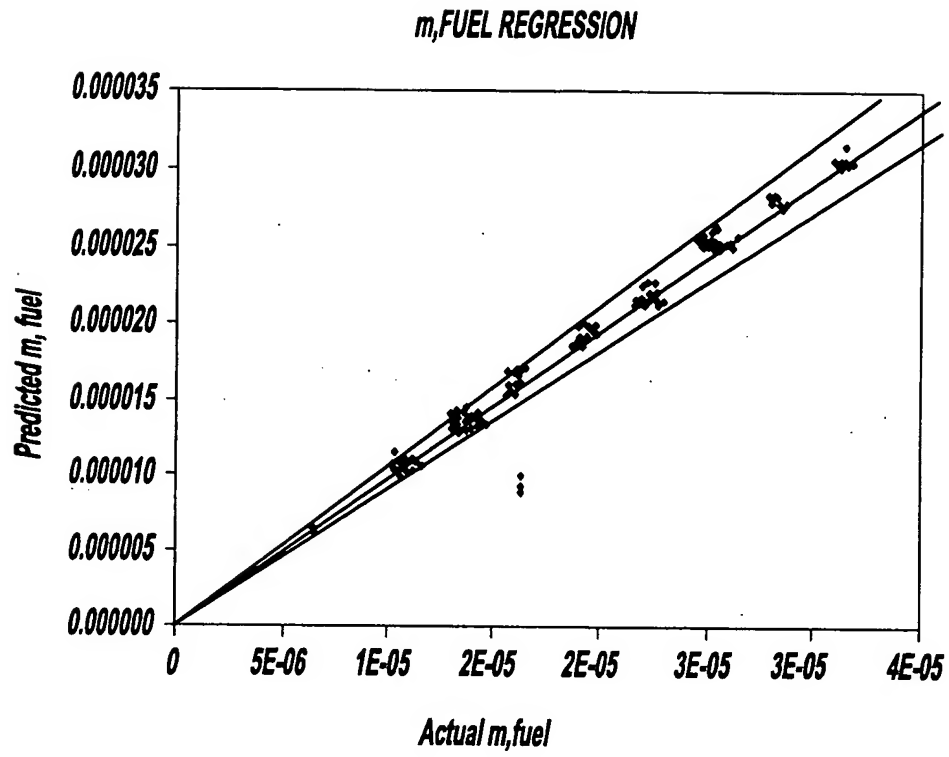


FIG - 6

Spark Retard Torque Reduction Regression**FIG - 7**

**FIG - 8**

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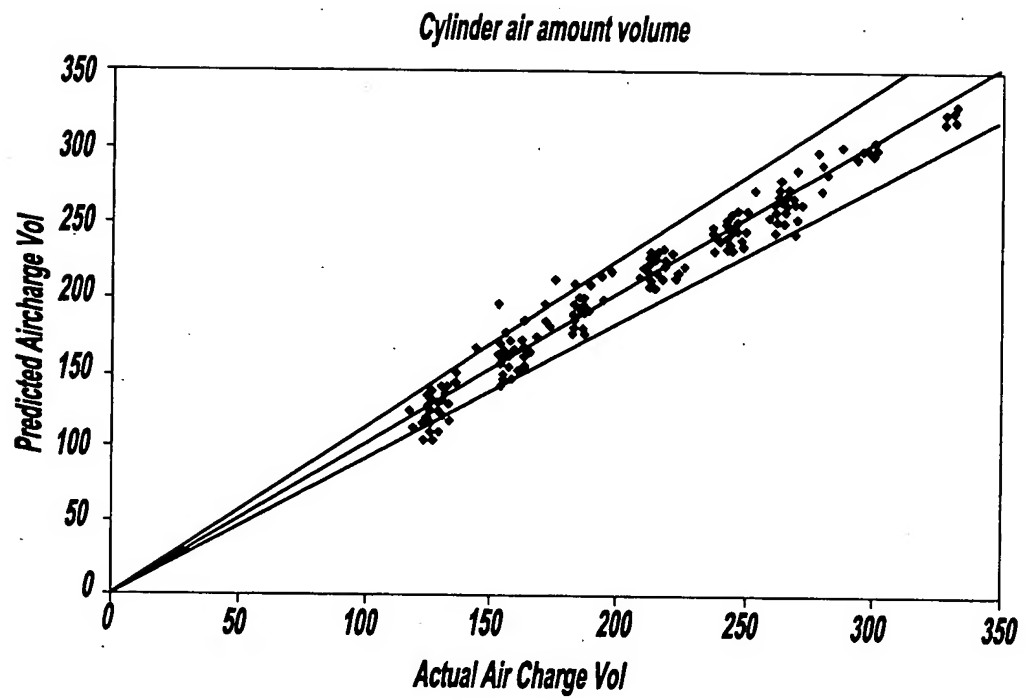
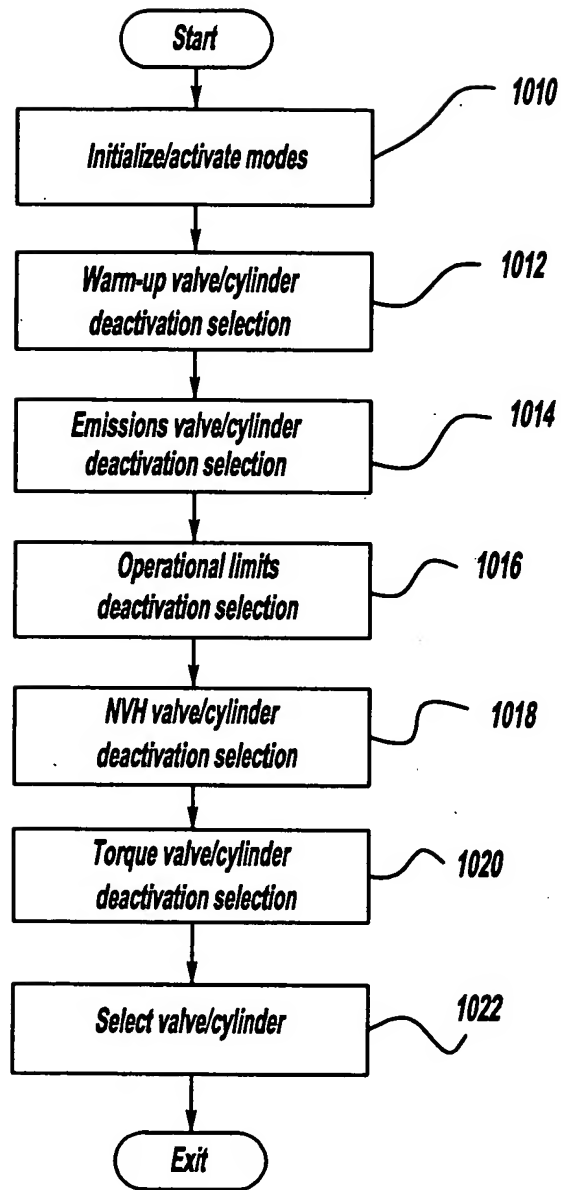


FIG - 9

**FIG - 10**

COLUMN 0 COLUMN 3

↓ DECREASING TORQUE ↑

V2	1	1	1	1	ROW 3
12-STROKE	1	1	1	1	
V4	1	1	1	1	
V8	1	1	1	1	ROW 0
	DIDE	DIAE	AIDE	AIAE	

→ DECREASING TORQUE →

FIG - 11

COLUMN 0 COLUMN 3

↓ DECREASING TORQUE ↑

V2	0	0	0	0	ROW 3
12-STROKE	0	0	0	0	
V4	1	1	0	0	
V8	1	1	1	1	ROW 0
	DIDE	DIAE	AIDE	AIAE	

→ DECREASING TORQUE →

FIG - 12

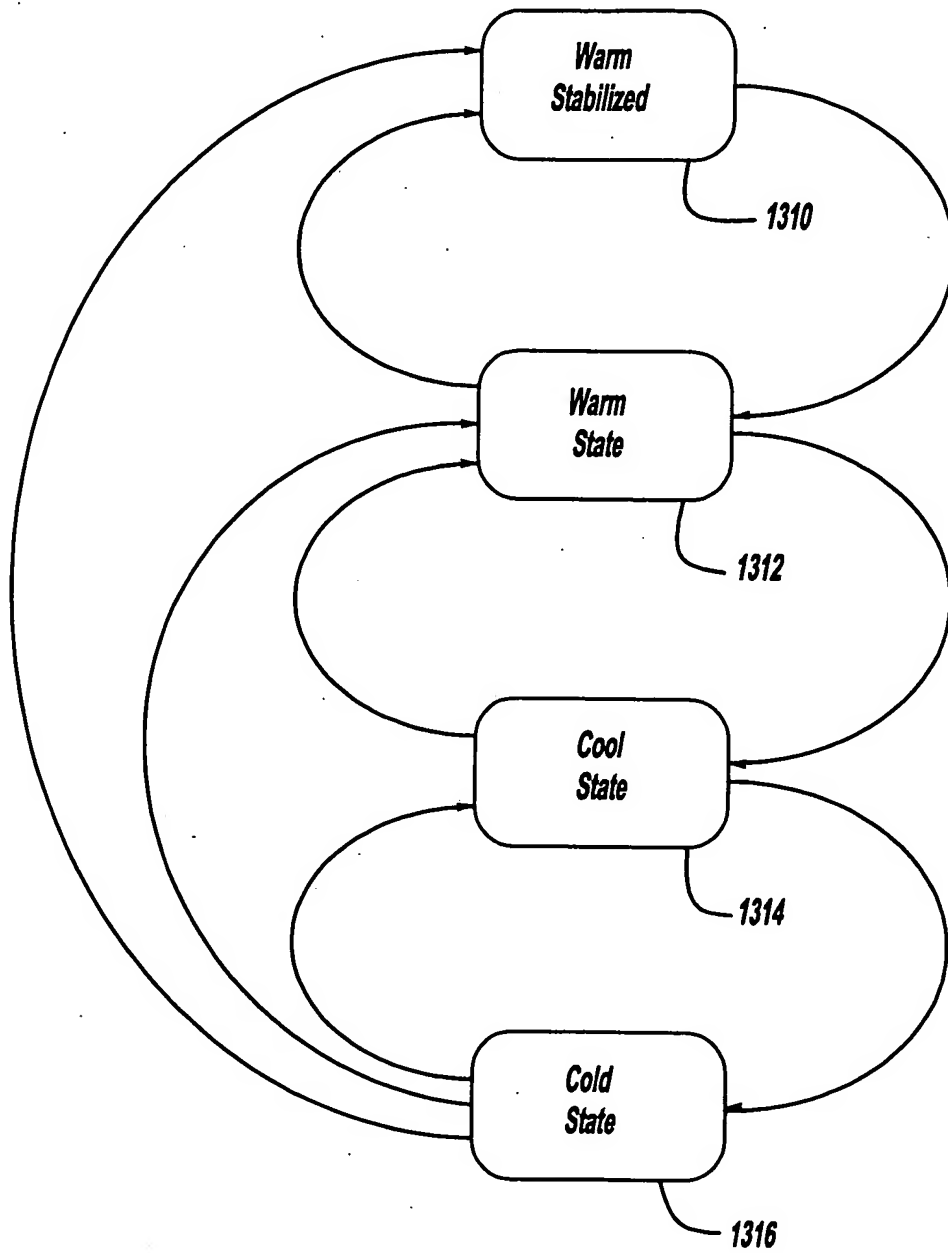


FIG - 13

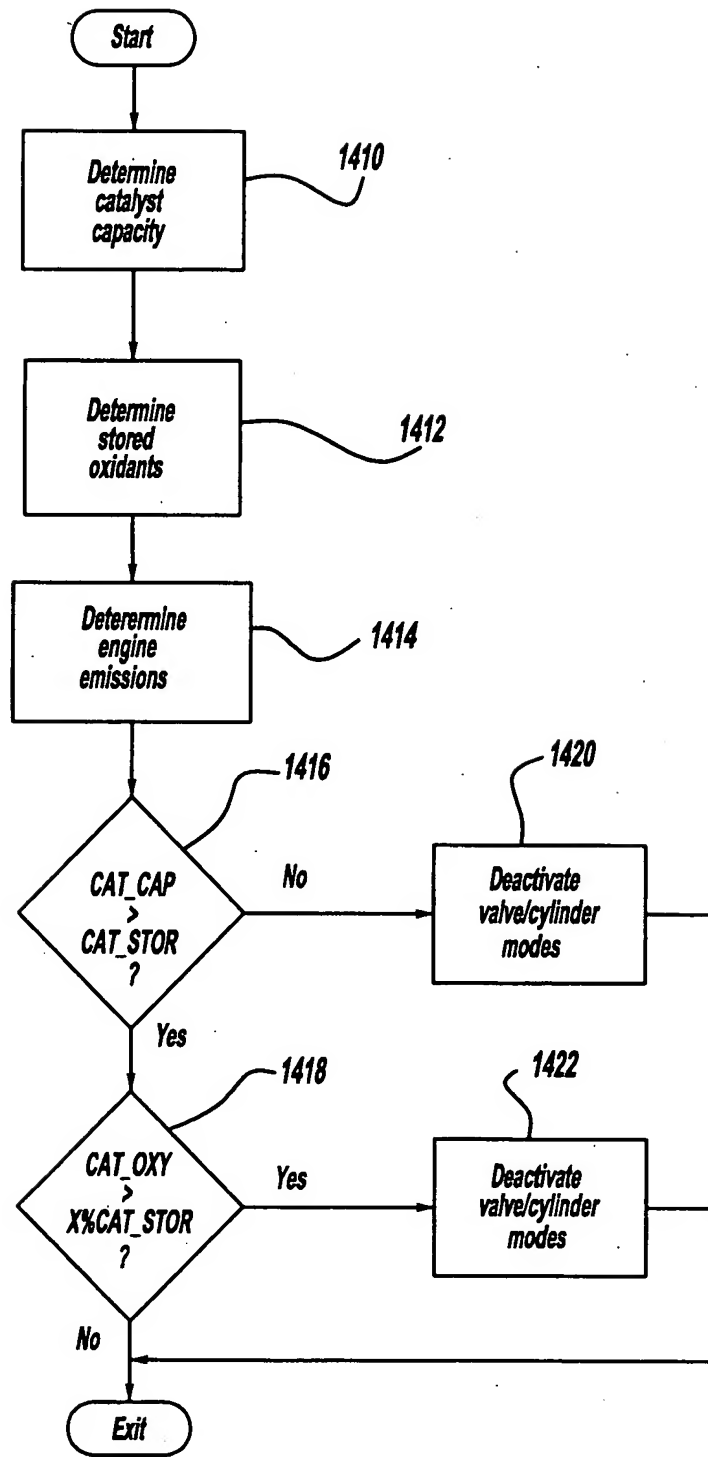
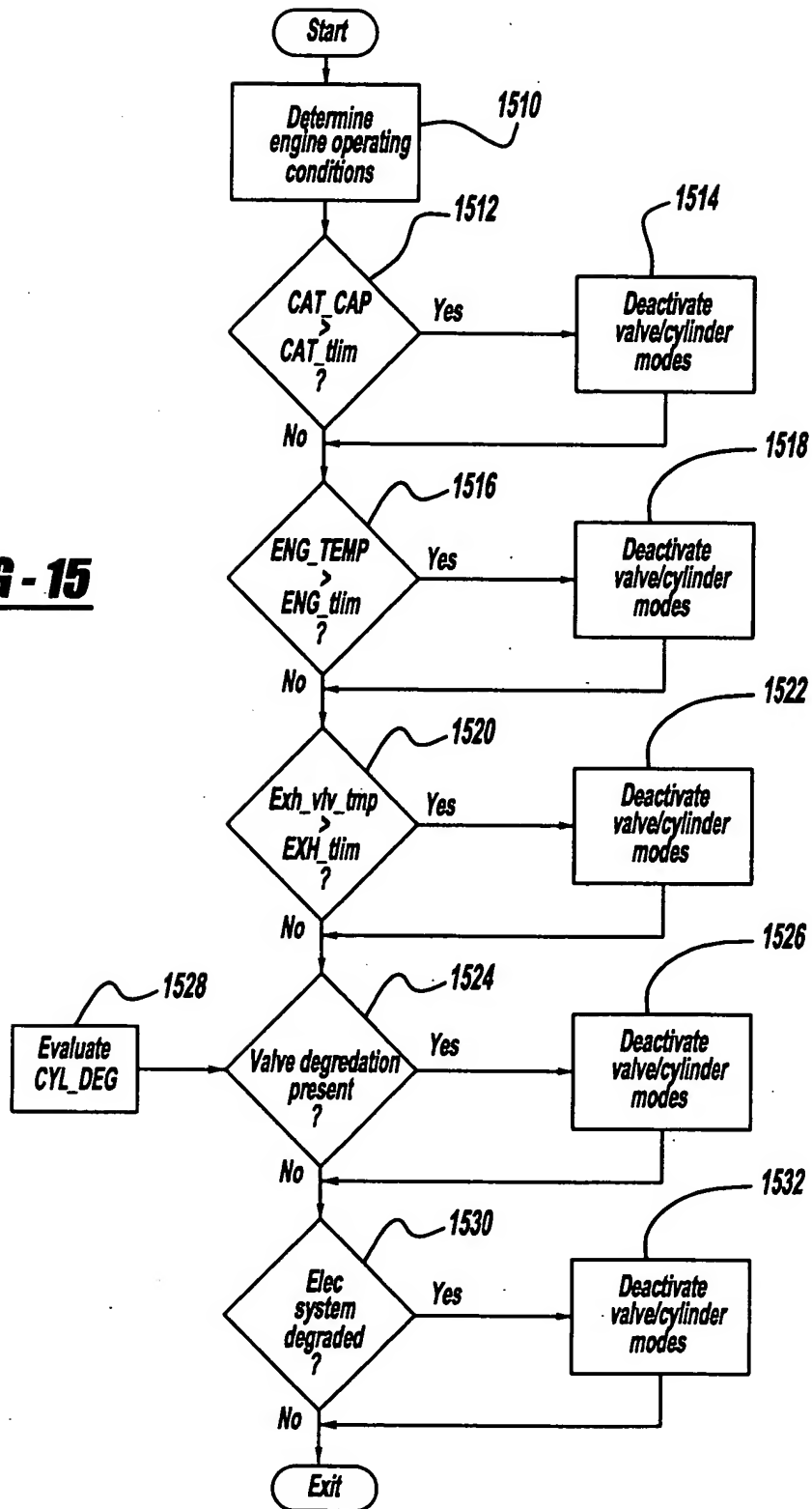
FIG - 14

FIG - 15

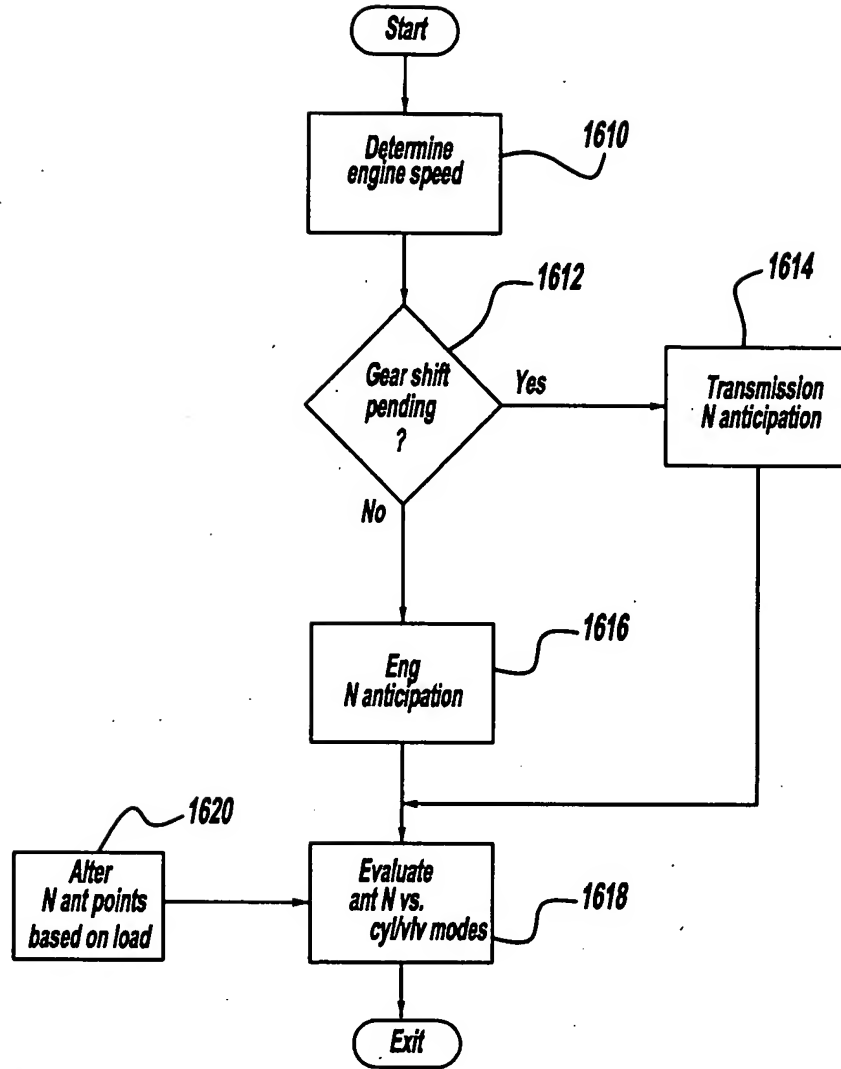
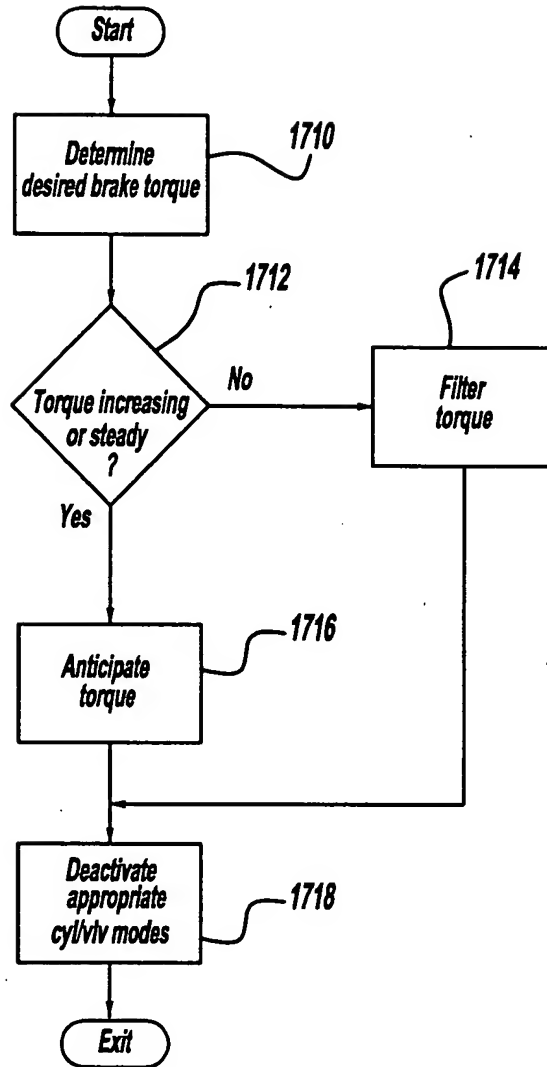
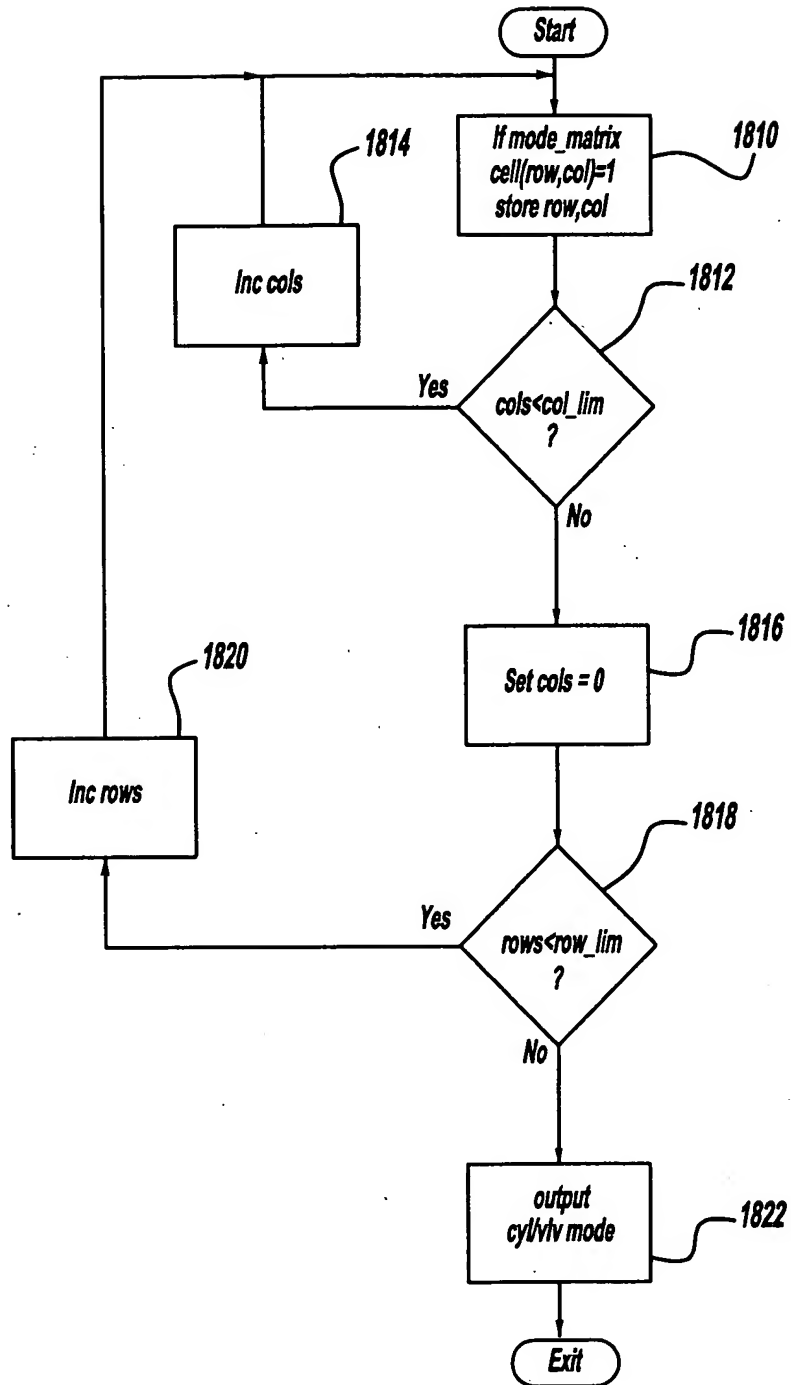


FIG - 16

**FIG - 17**

**FIG - 18**

Cylinder #1
Intake valve A

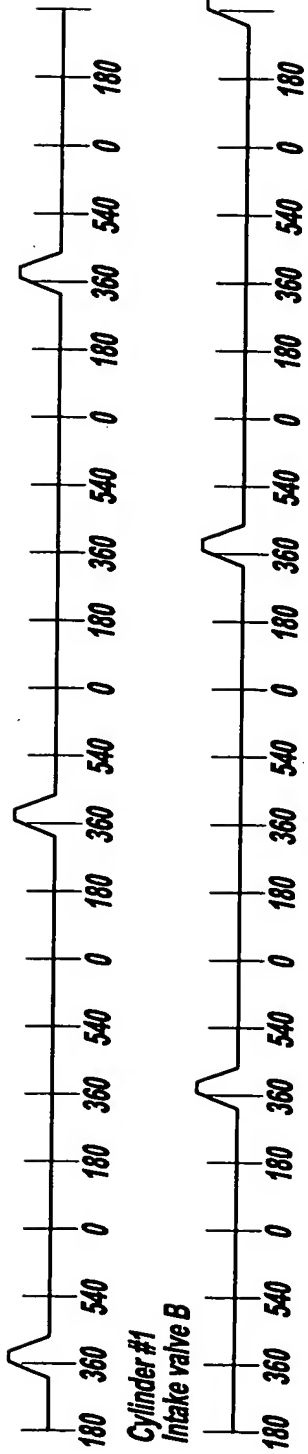


FIG - 19

Cylinder #1
Intake valve A

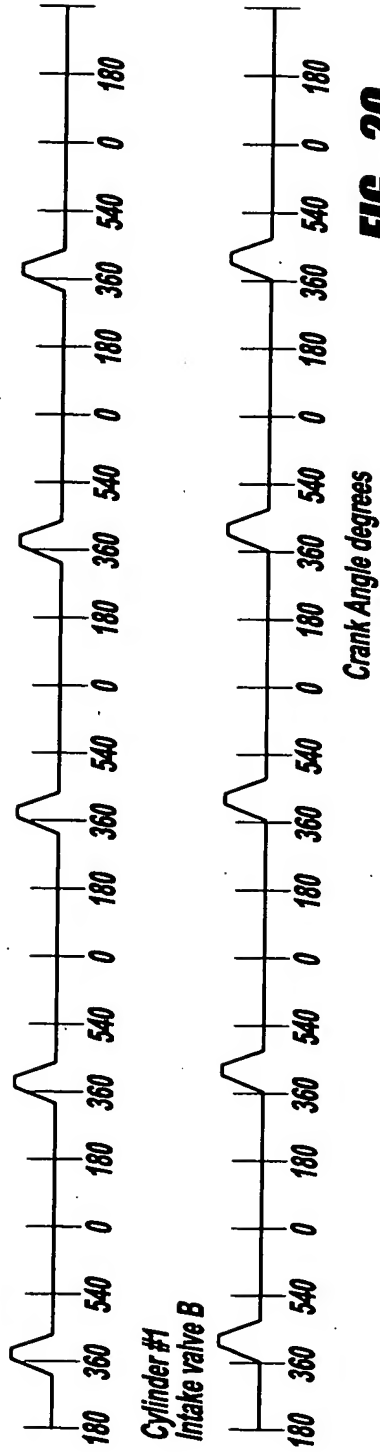


FIG - 20

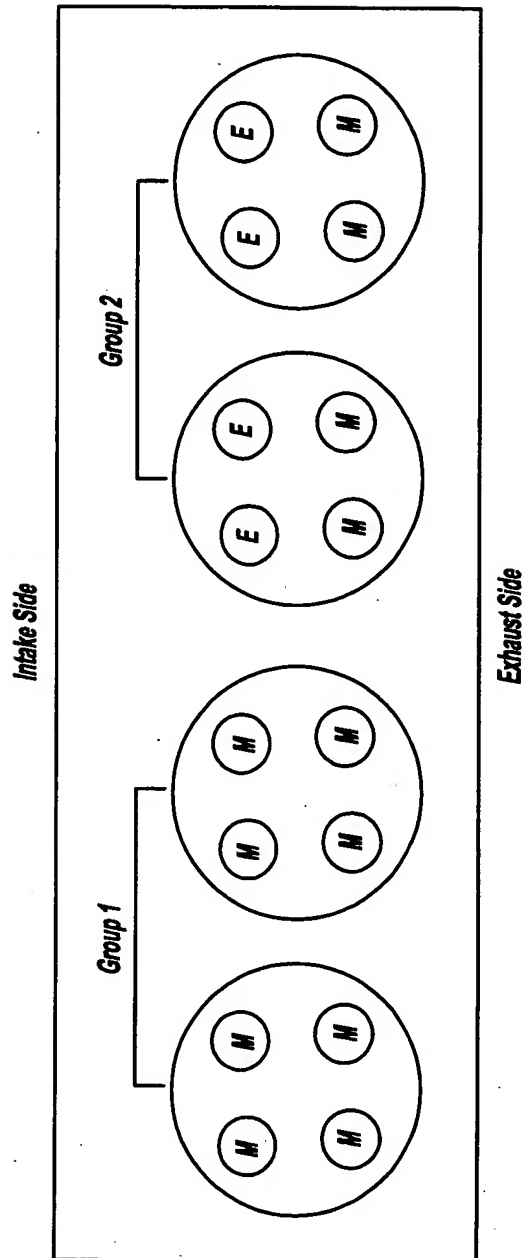


FIG - 21

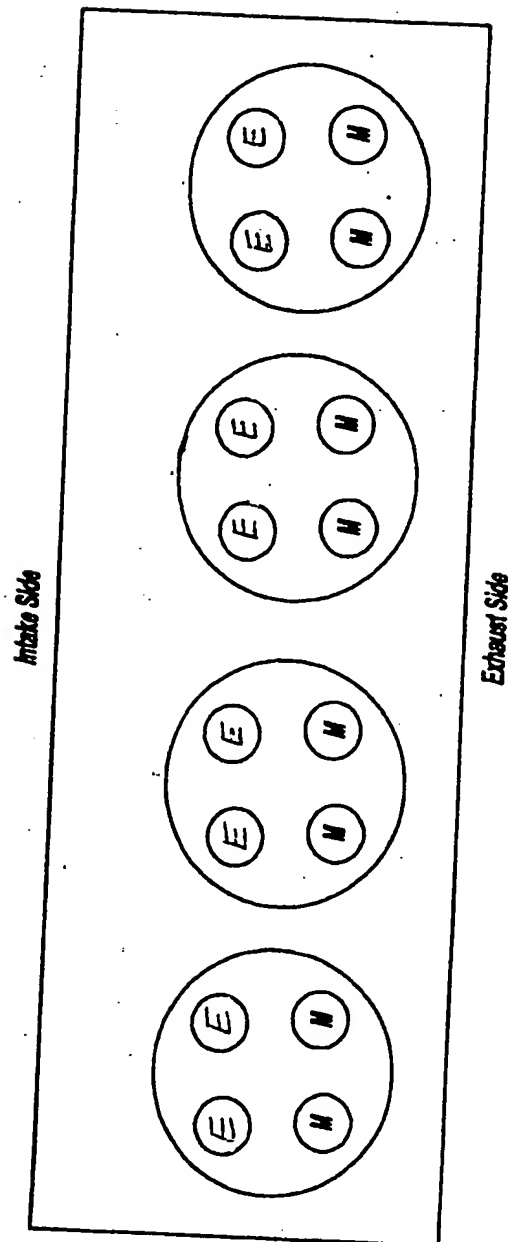


FIG - 21A

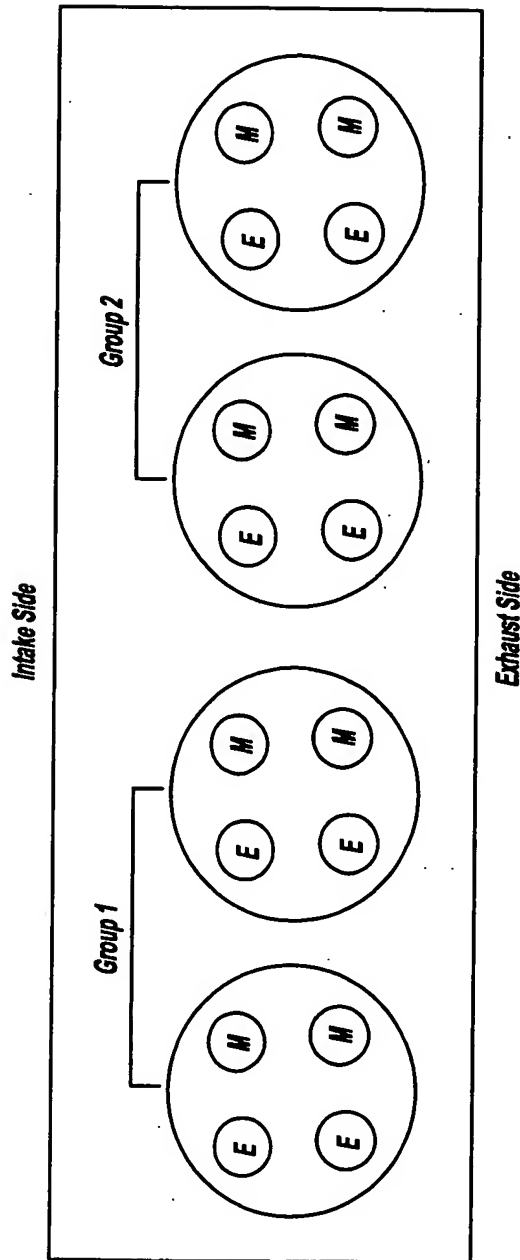


FIG - 22

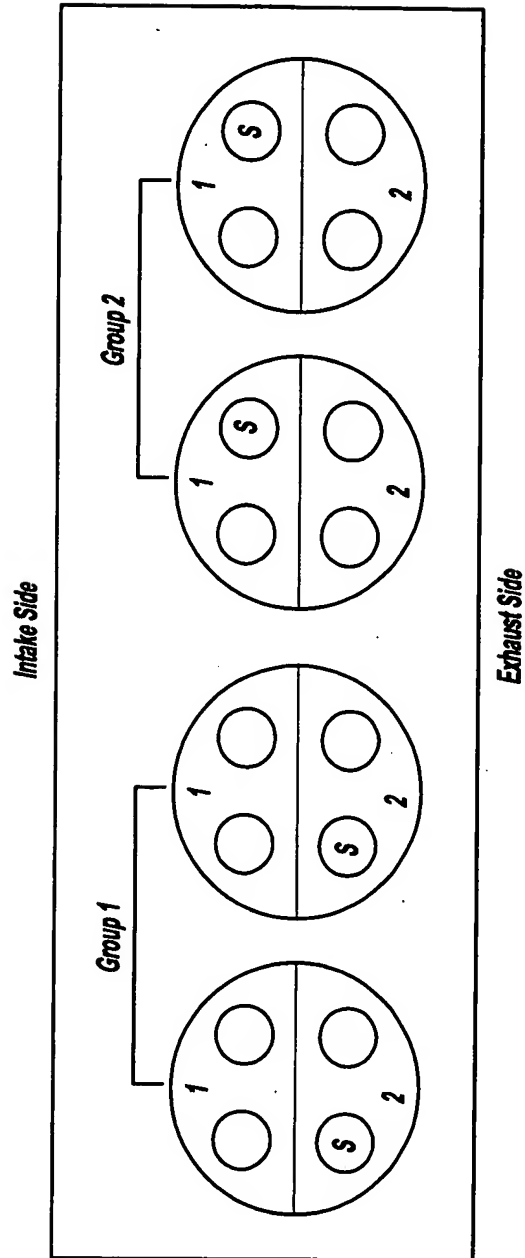


FIG - 23

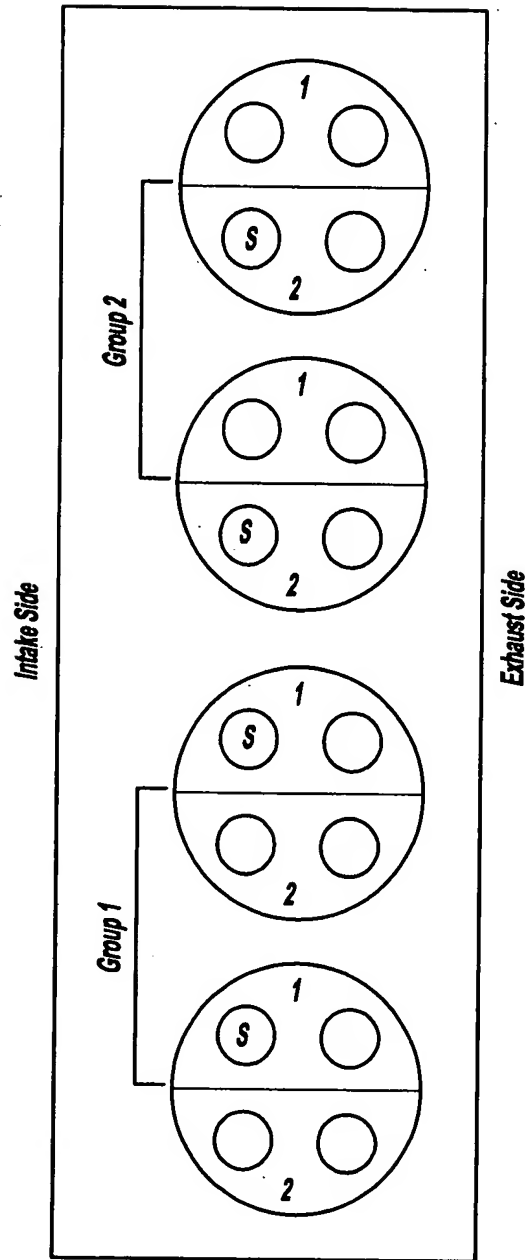


FIG - 24

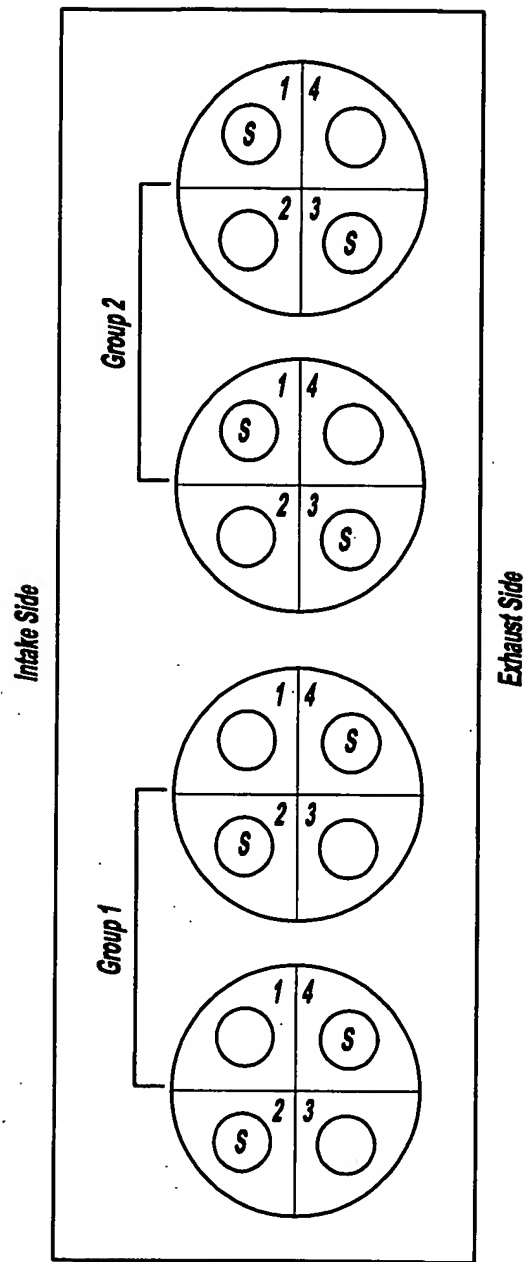


FIG - 25

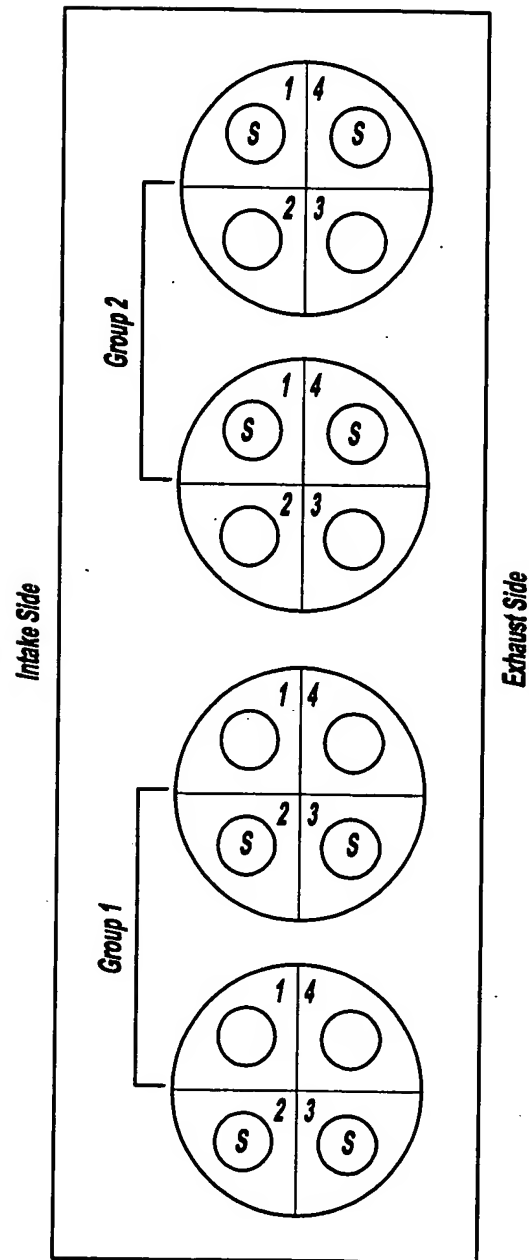


FIG - 26

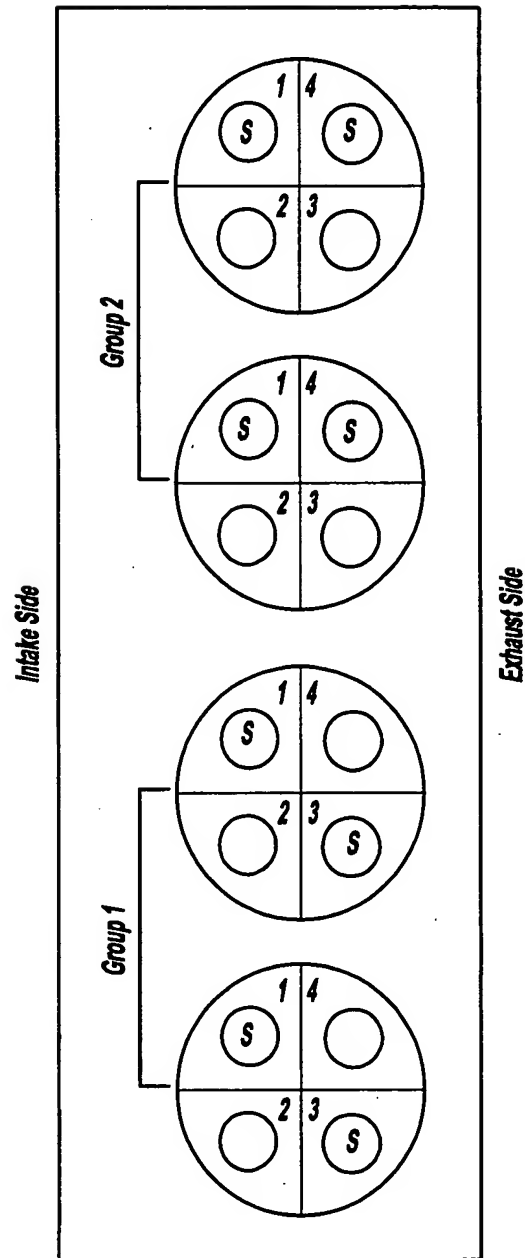
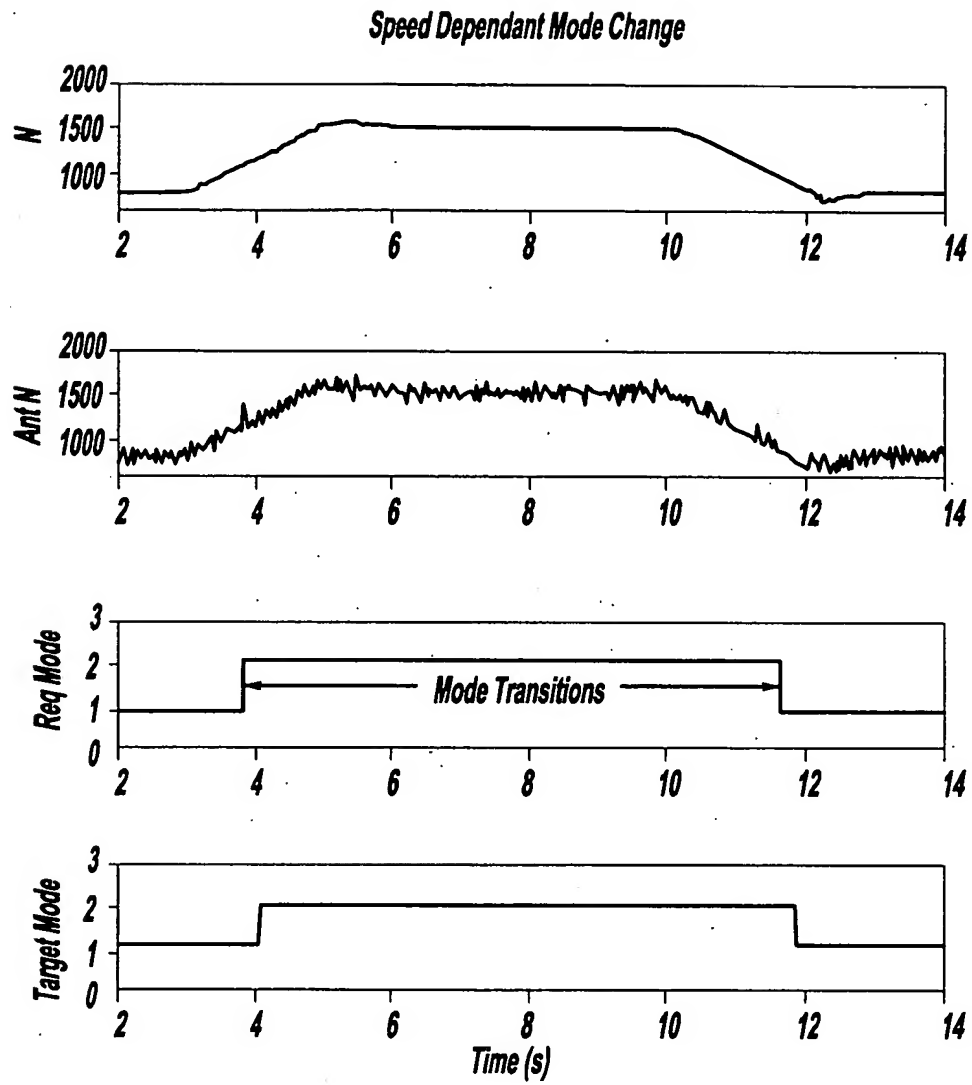
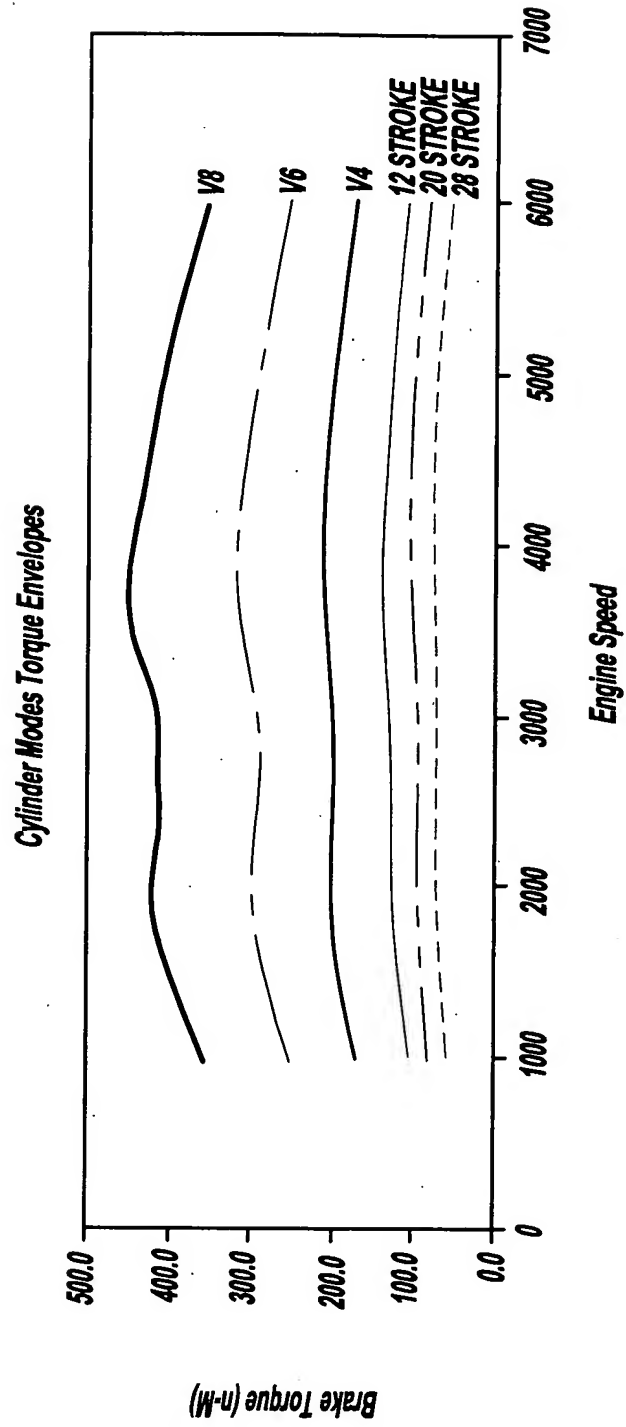


FIG - 27

**FIG - 28**

**FIG - 29**

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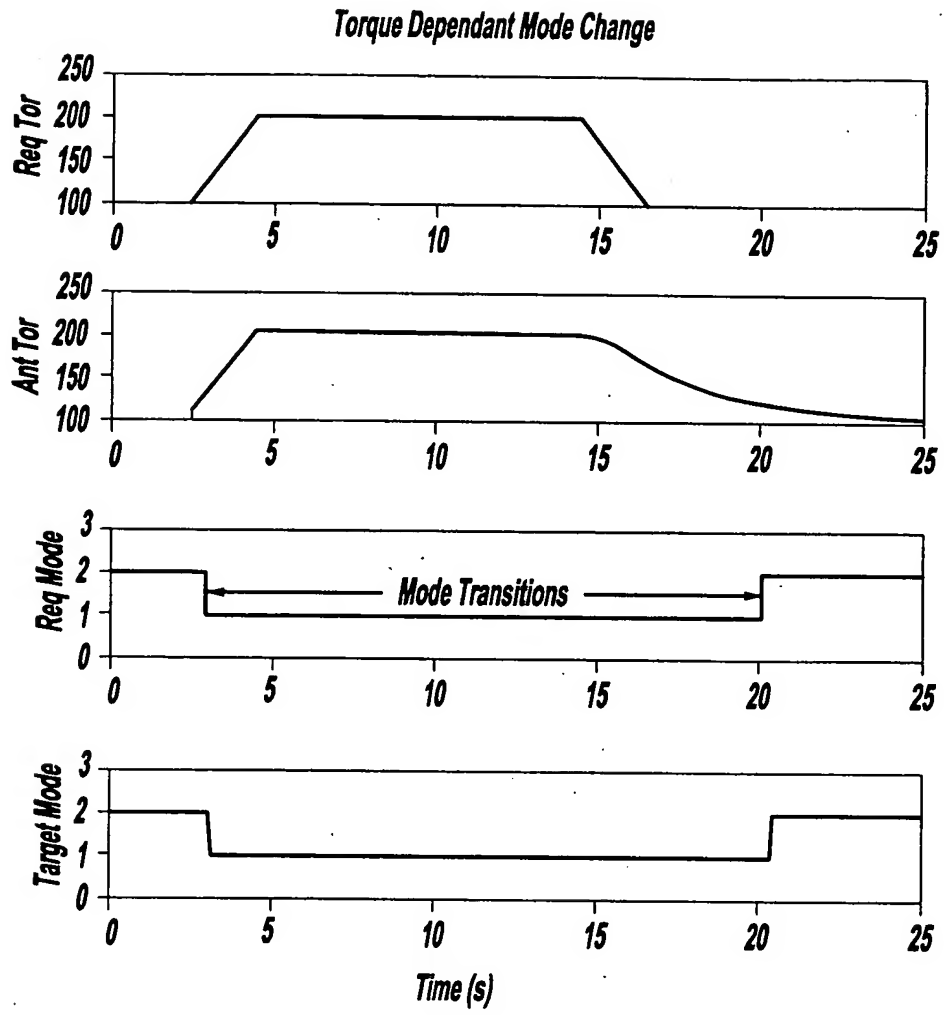
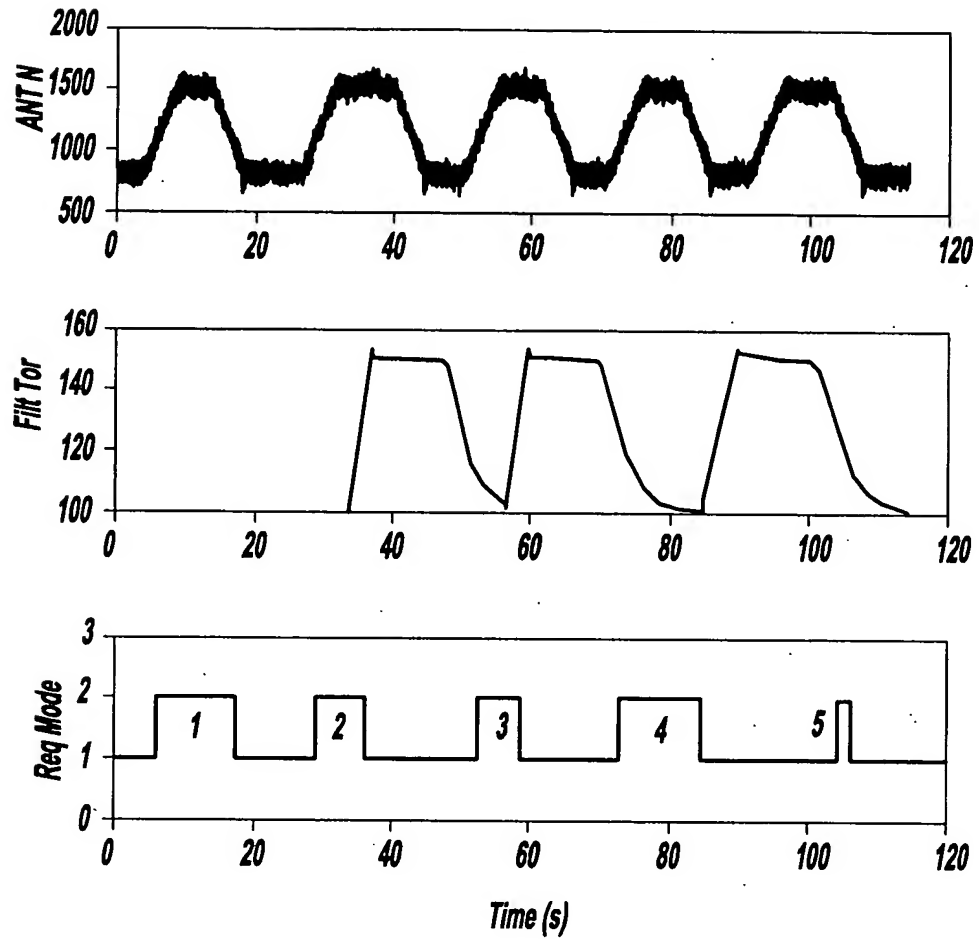
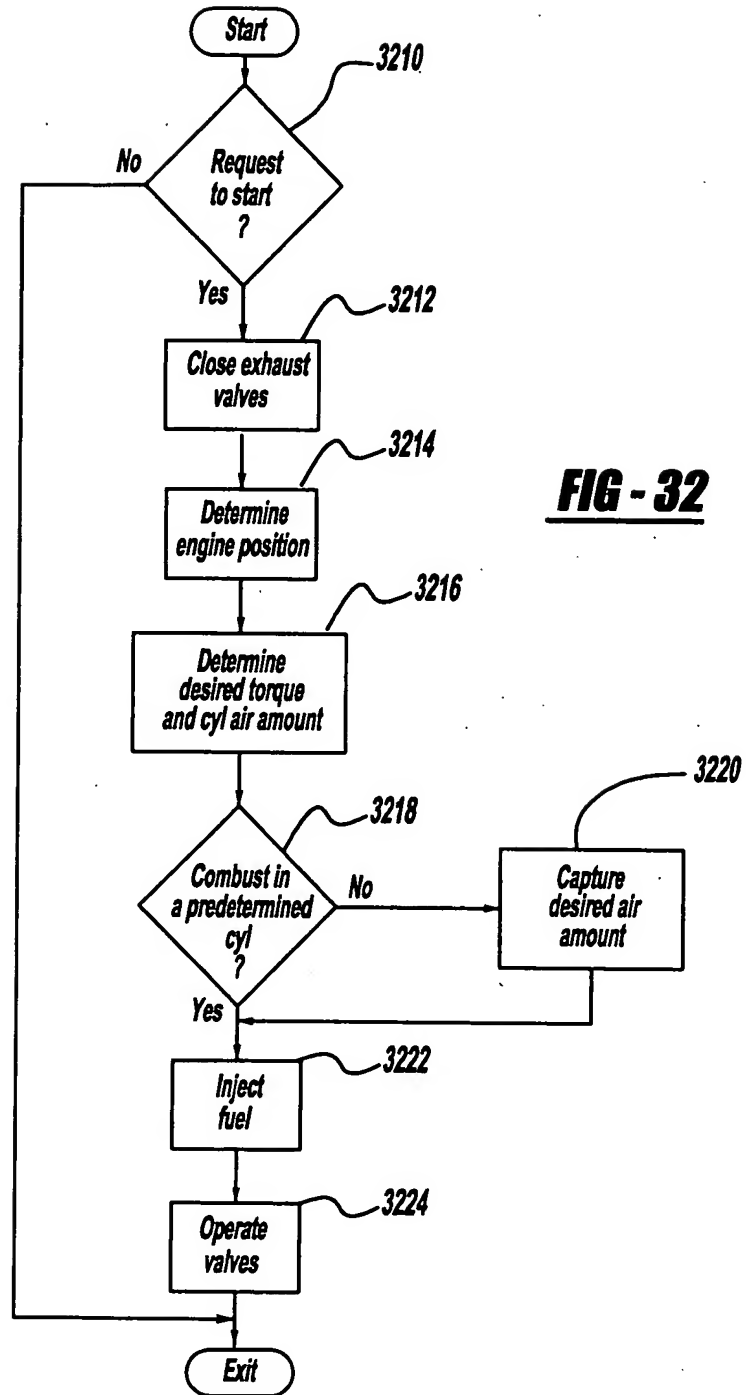
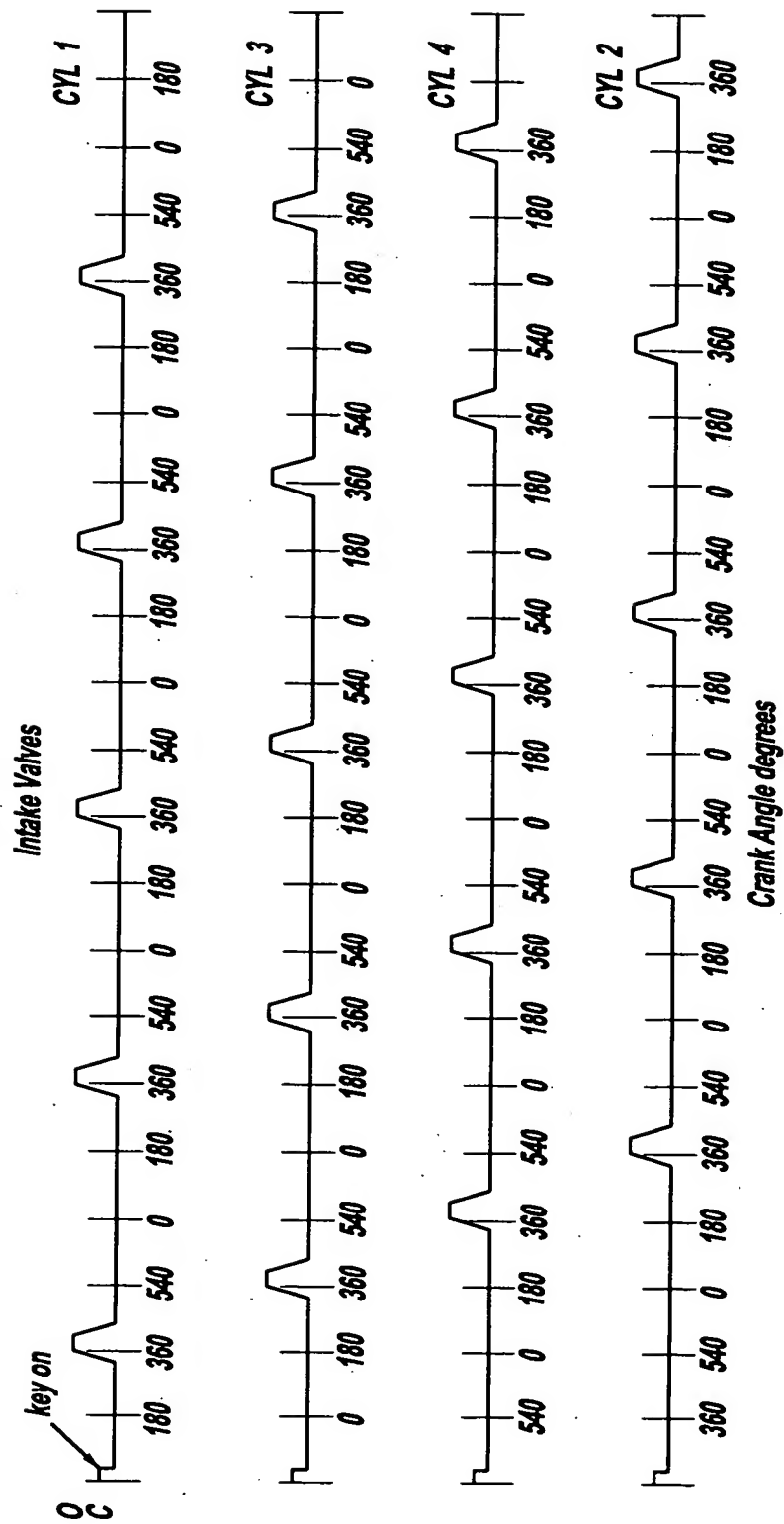
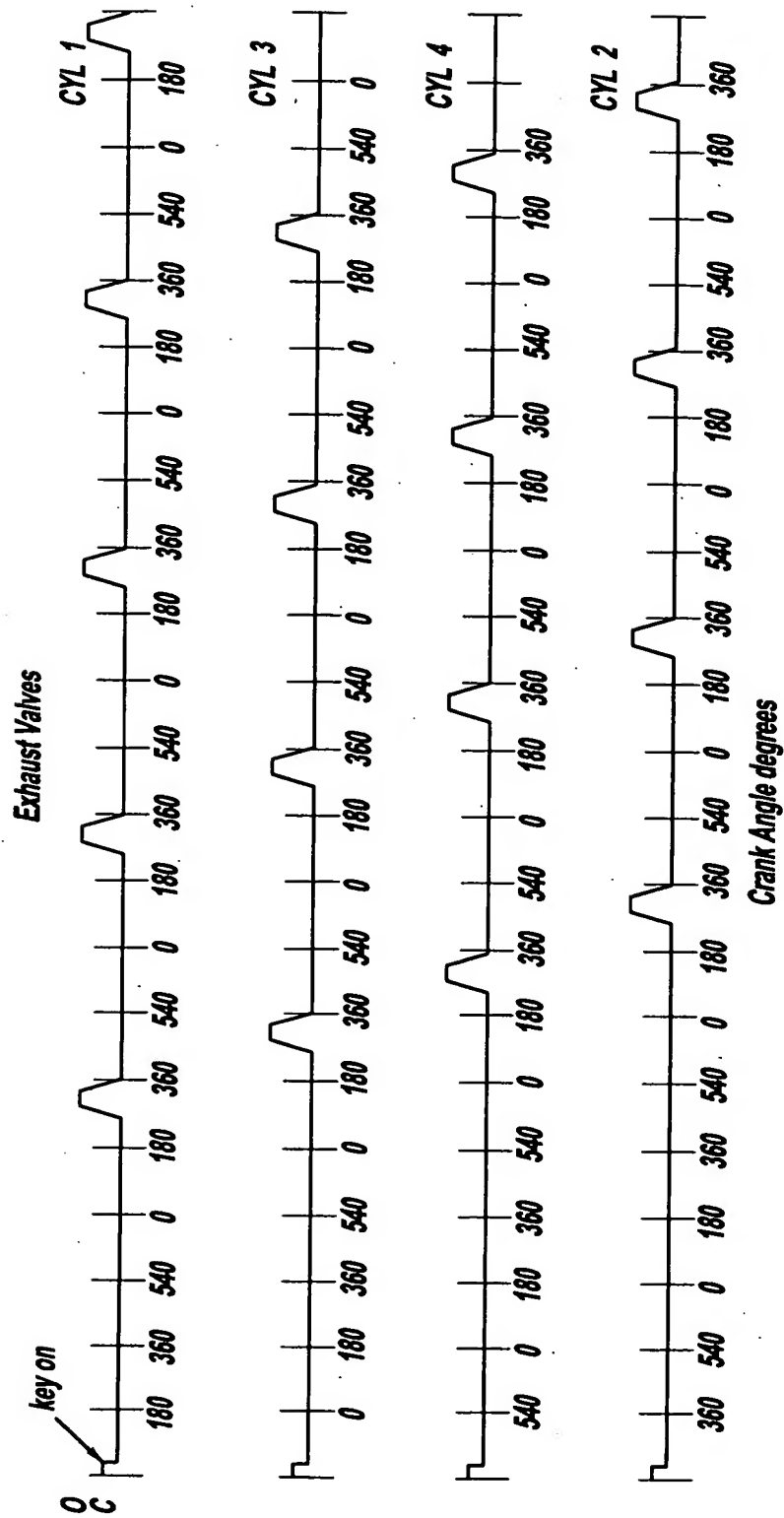


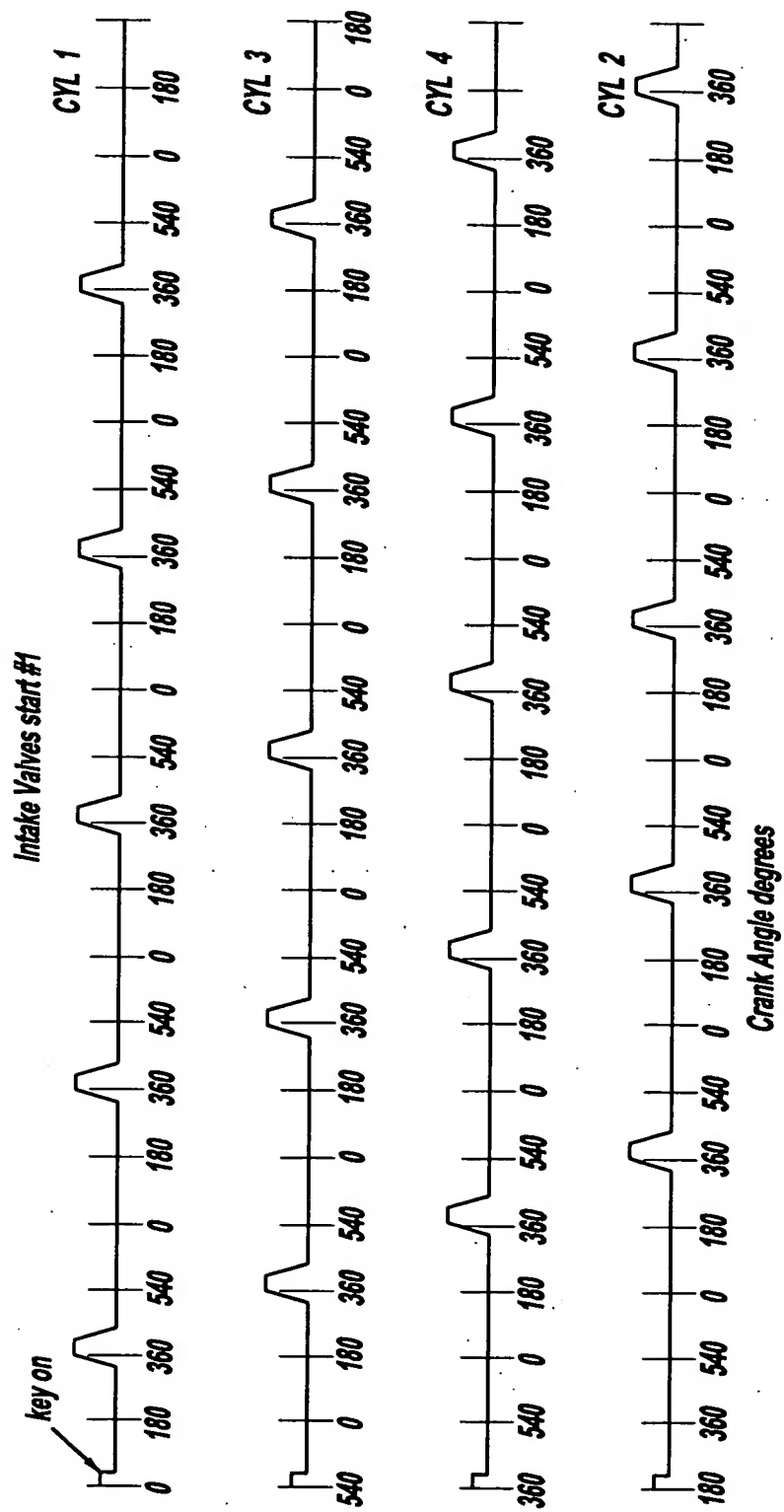
FIG - 30

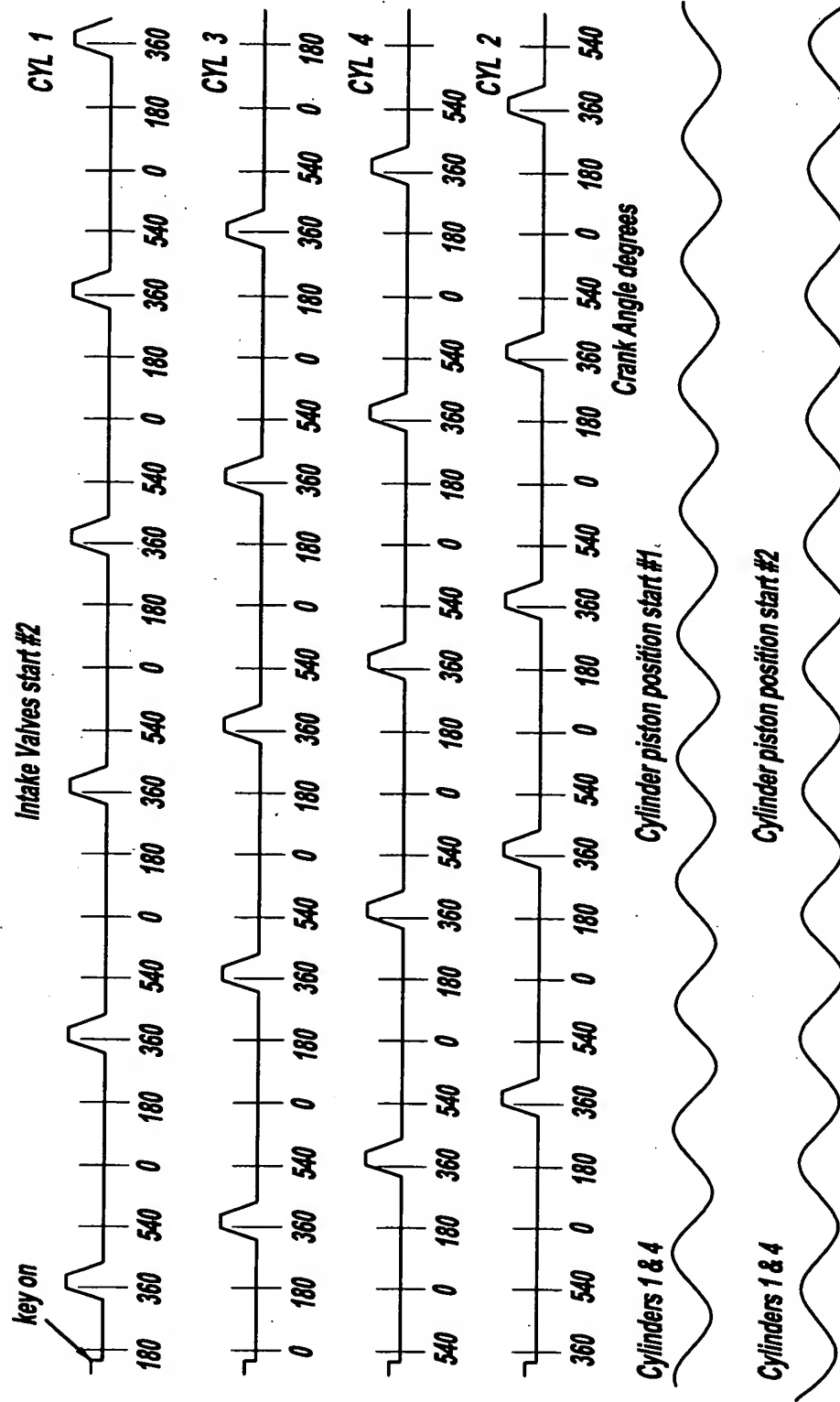
Speed and Torque Dependant Mode Changes**FIG - 31**

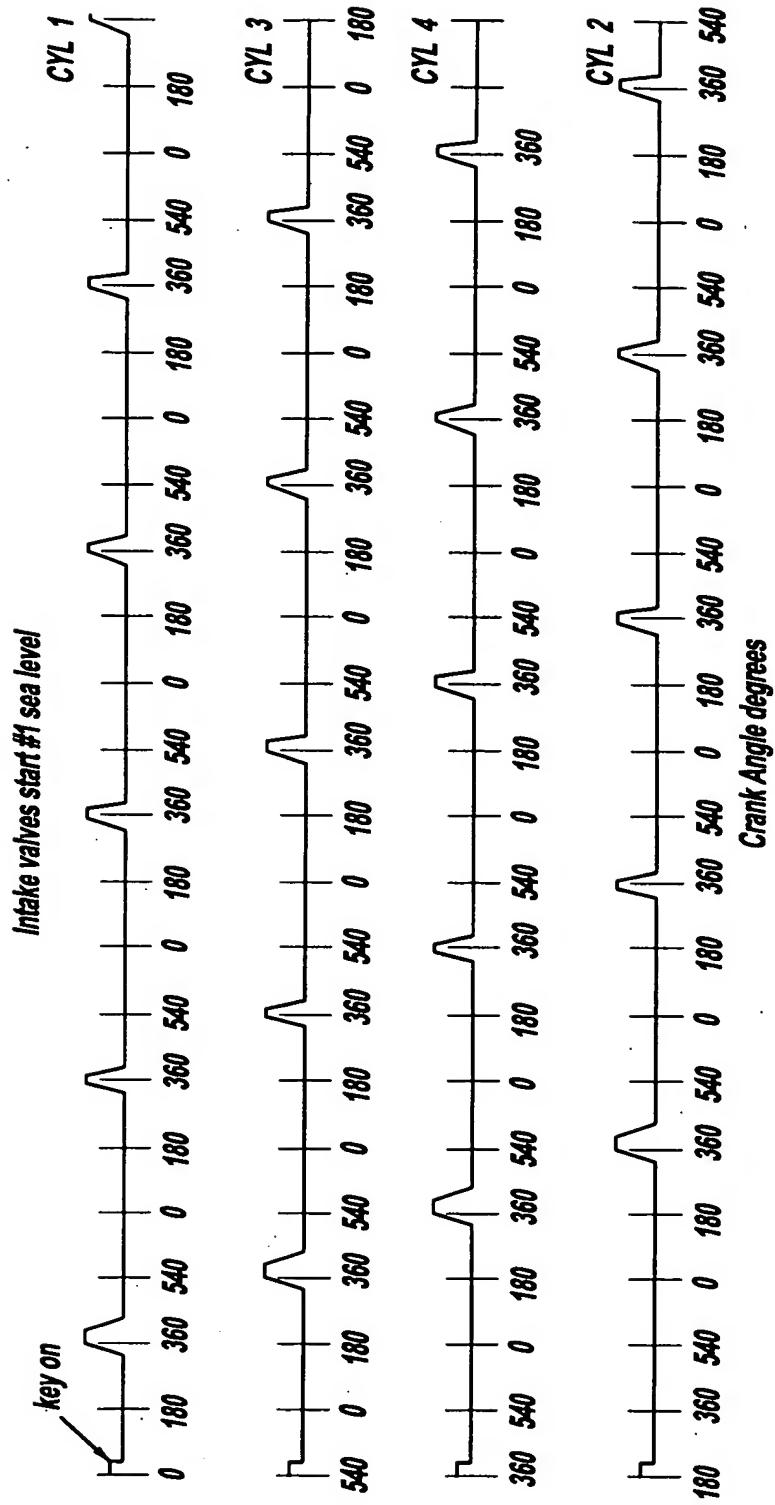


**FIG - 33a**

**FIG - 33b**

**FIG - 34a**

**FIG - 34b**

**FIG - 35a**

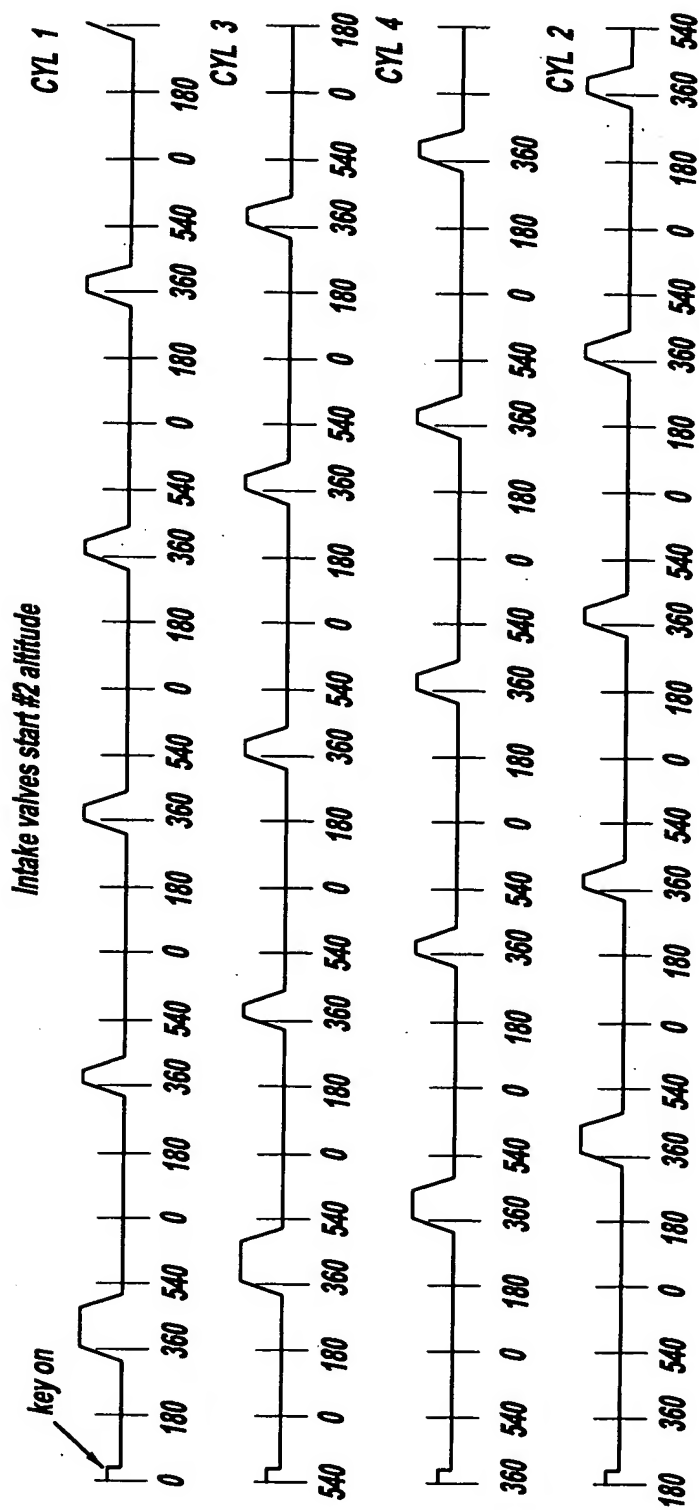
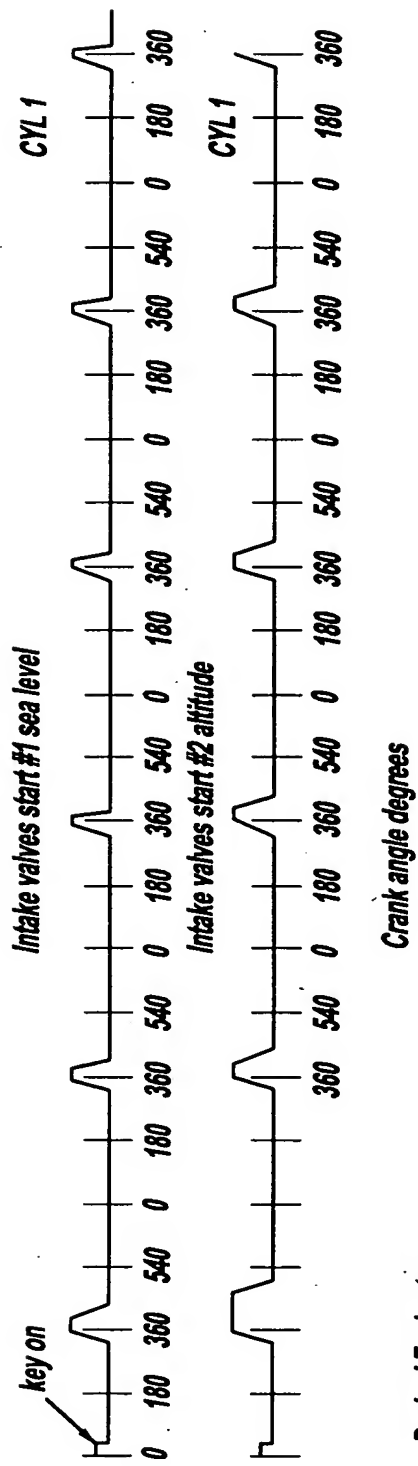
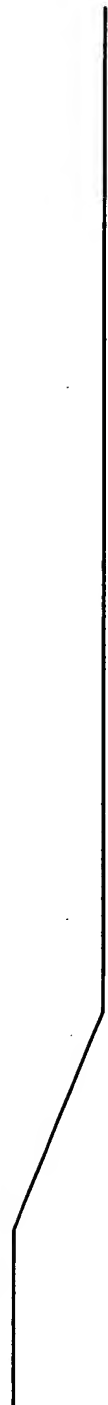


FIG - 35b



Desired Engine torque



Engine Speed

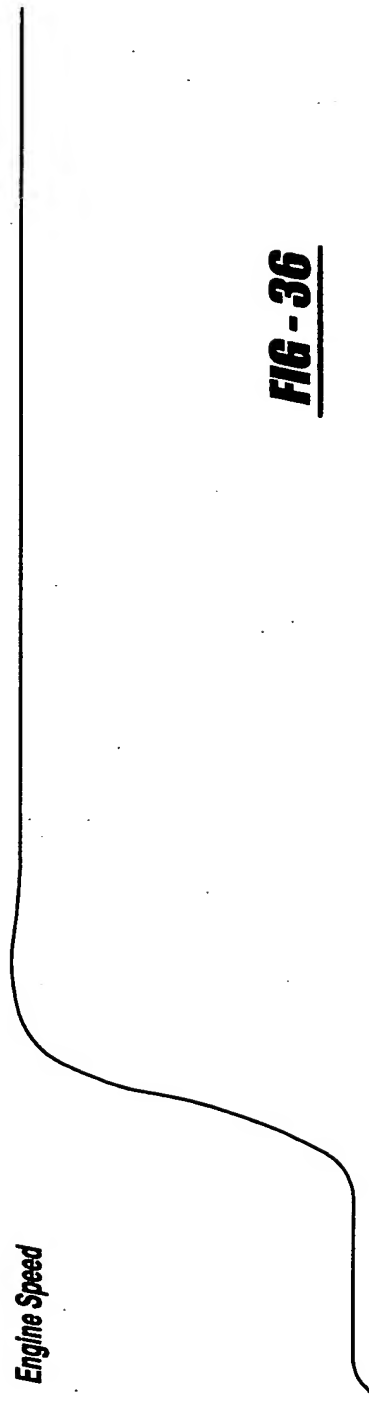
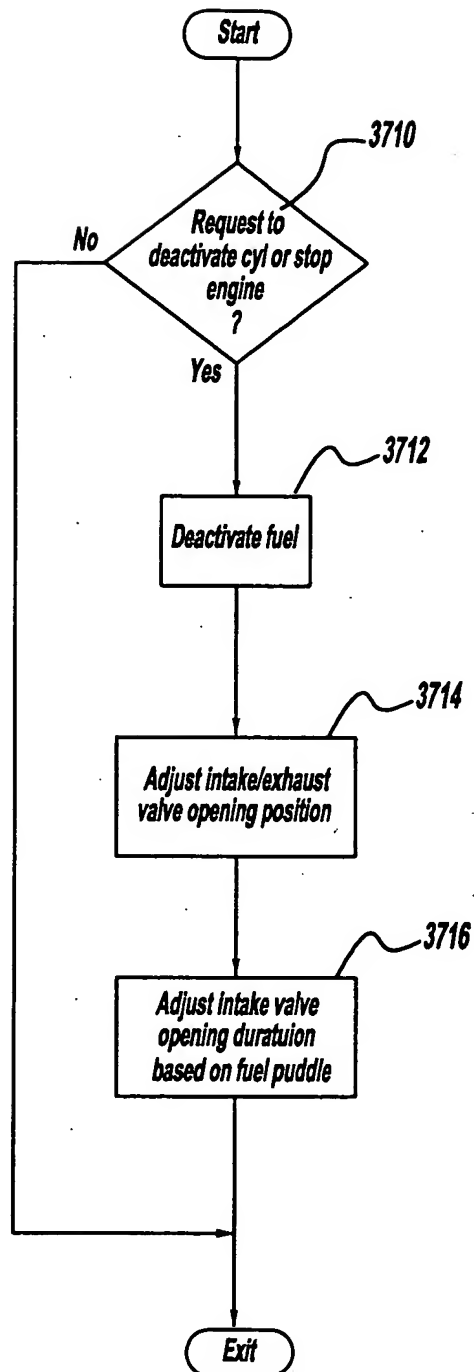
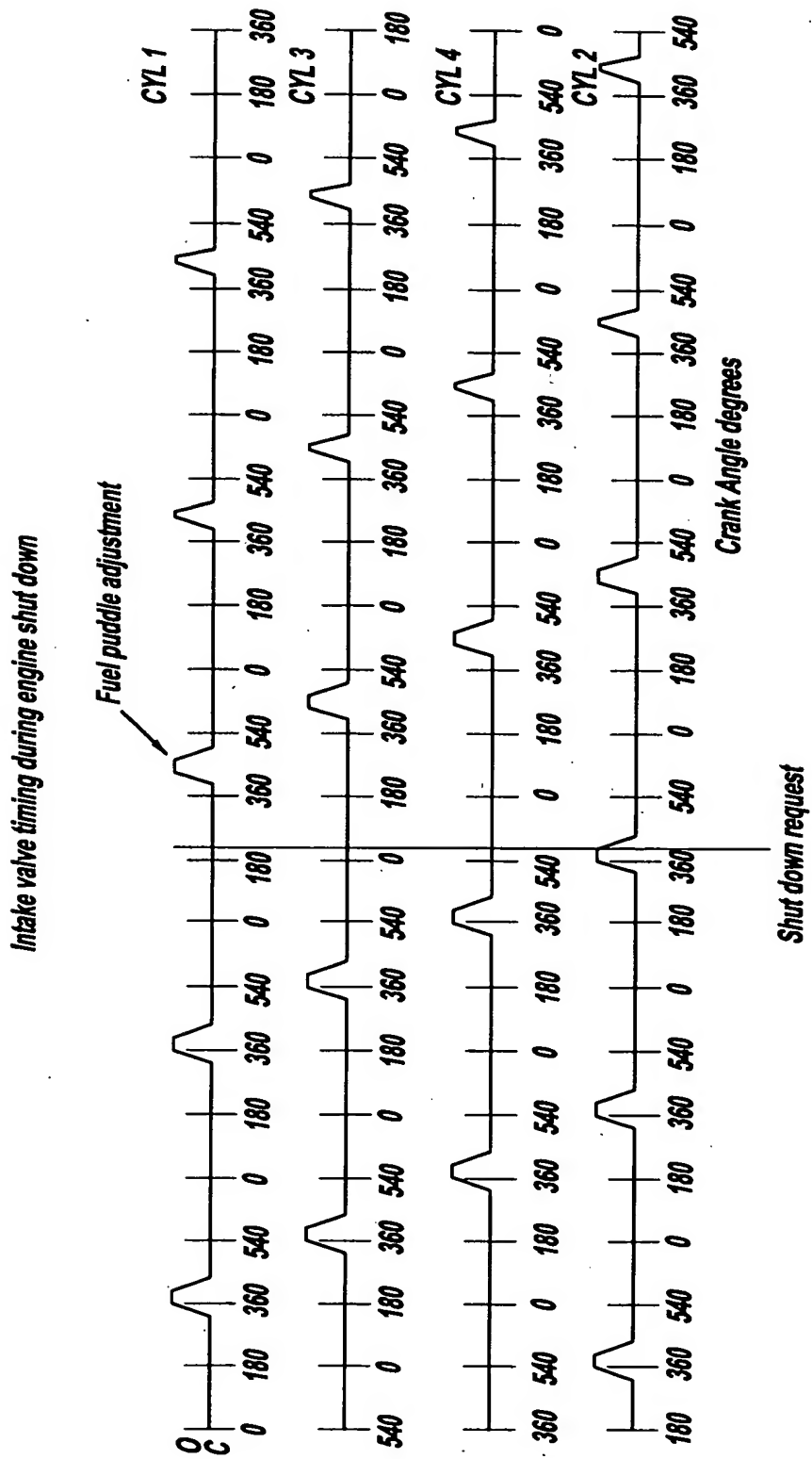
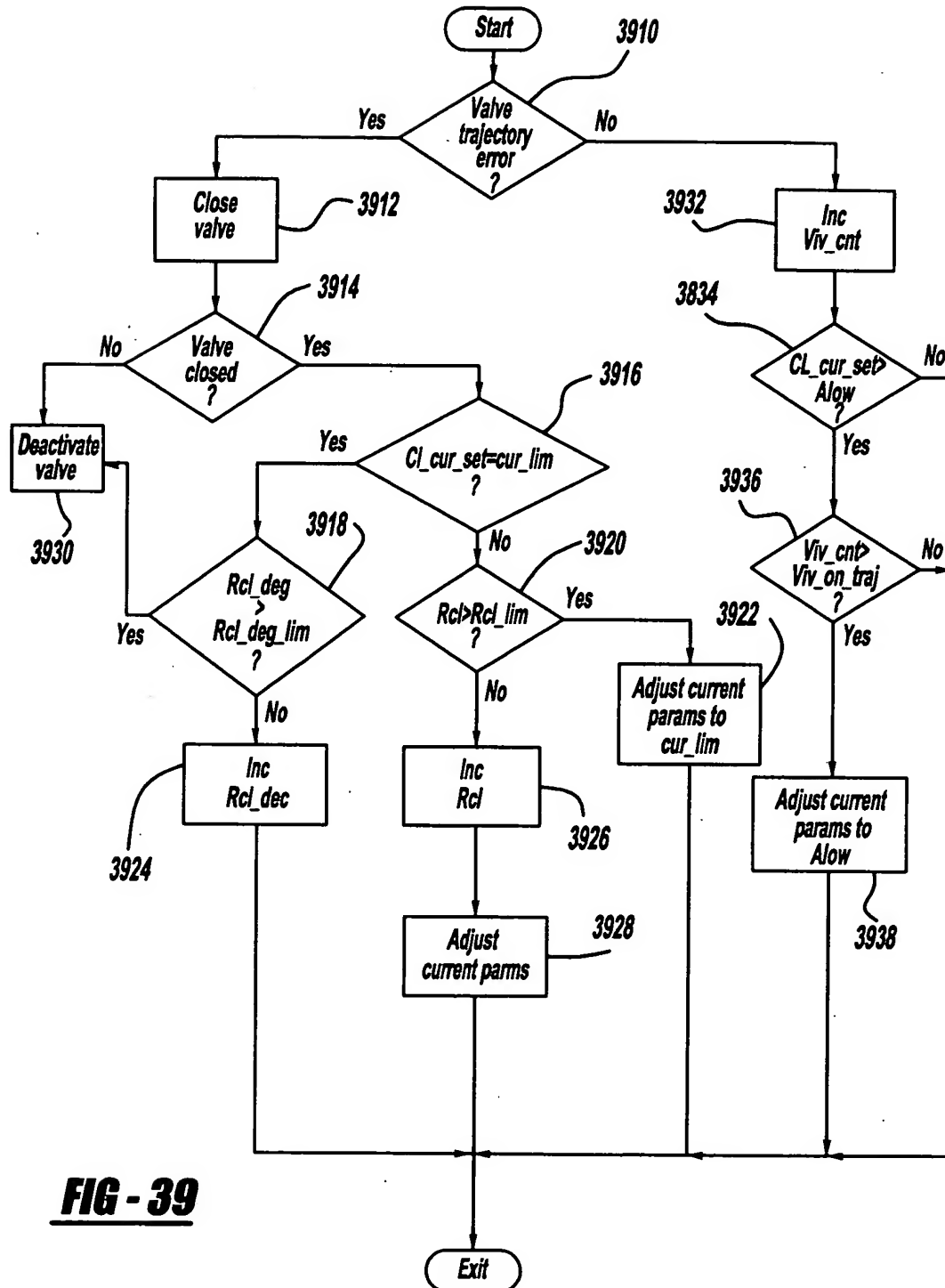


FIG - 36

**FIG - 37**

**FIG - 38**



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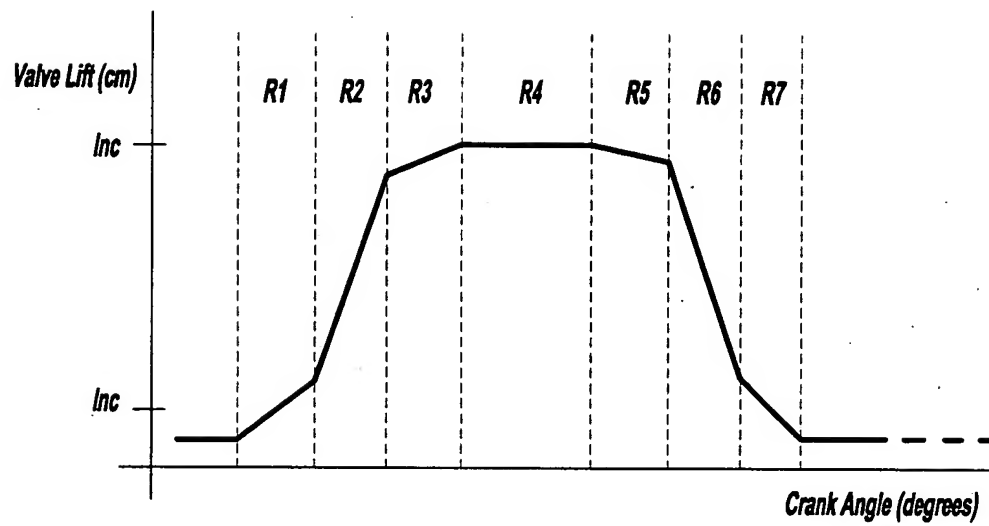


FIG - 40

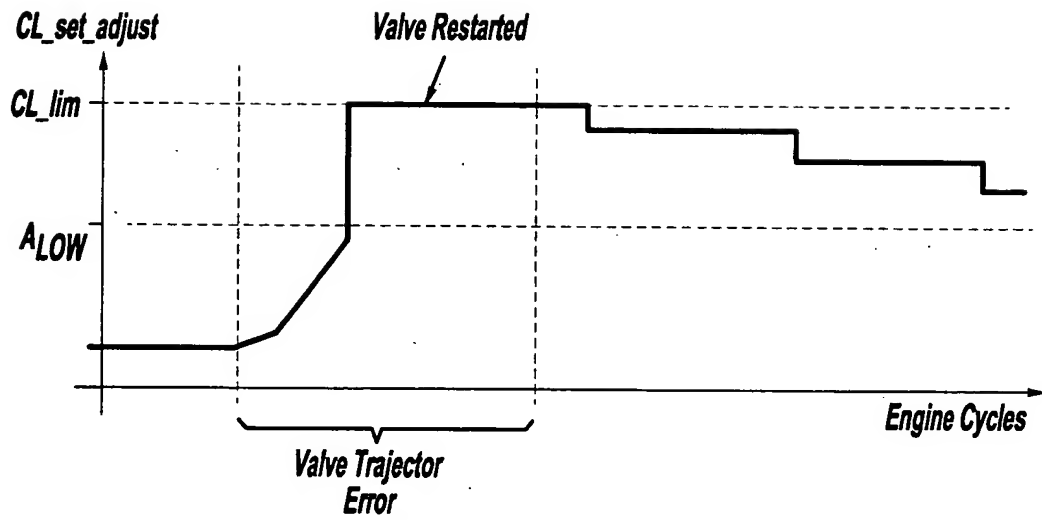
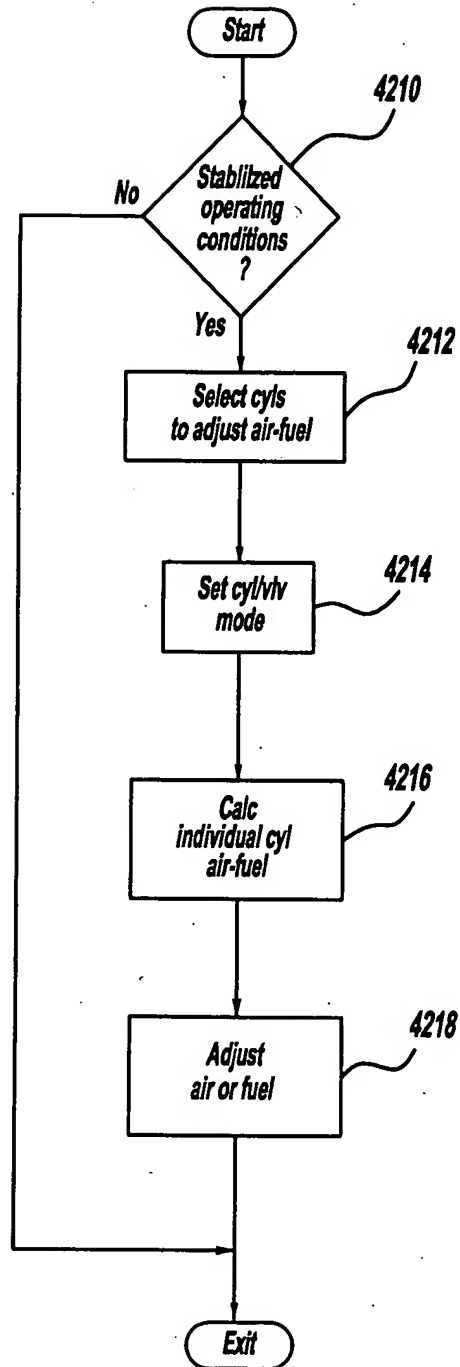


FIG - 41

**FIG - 42**

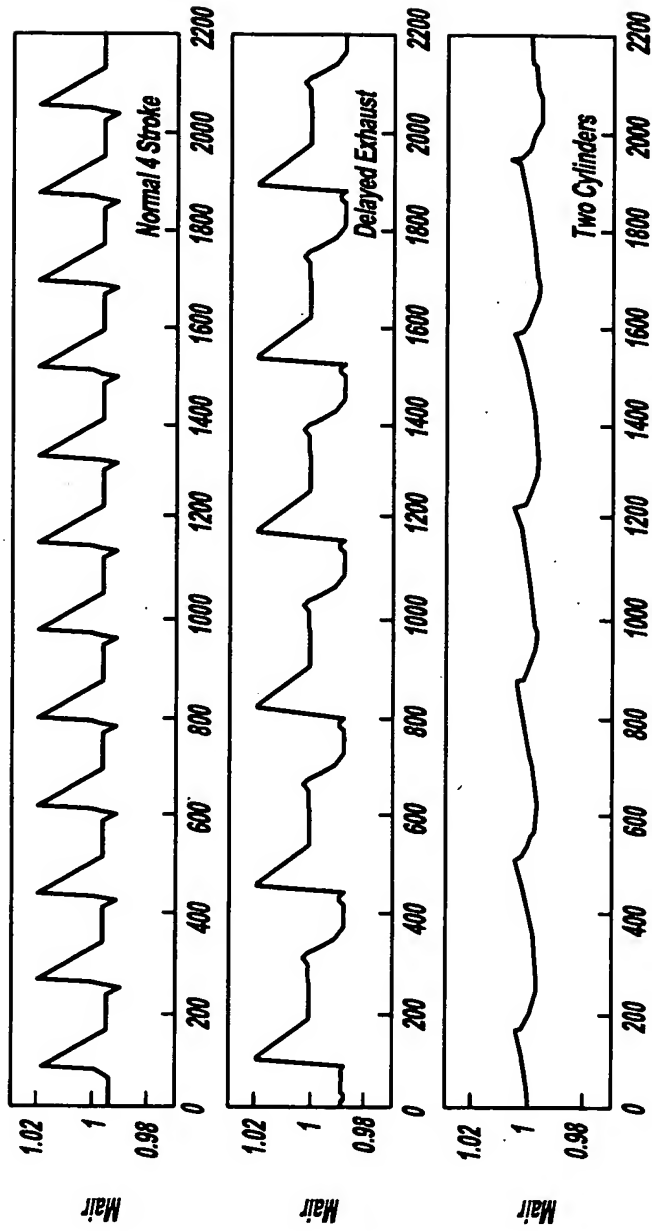
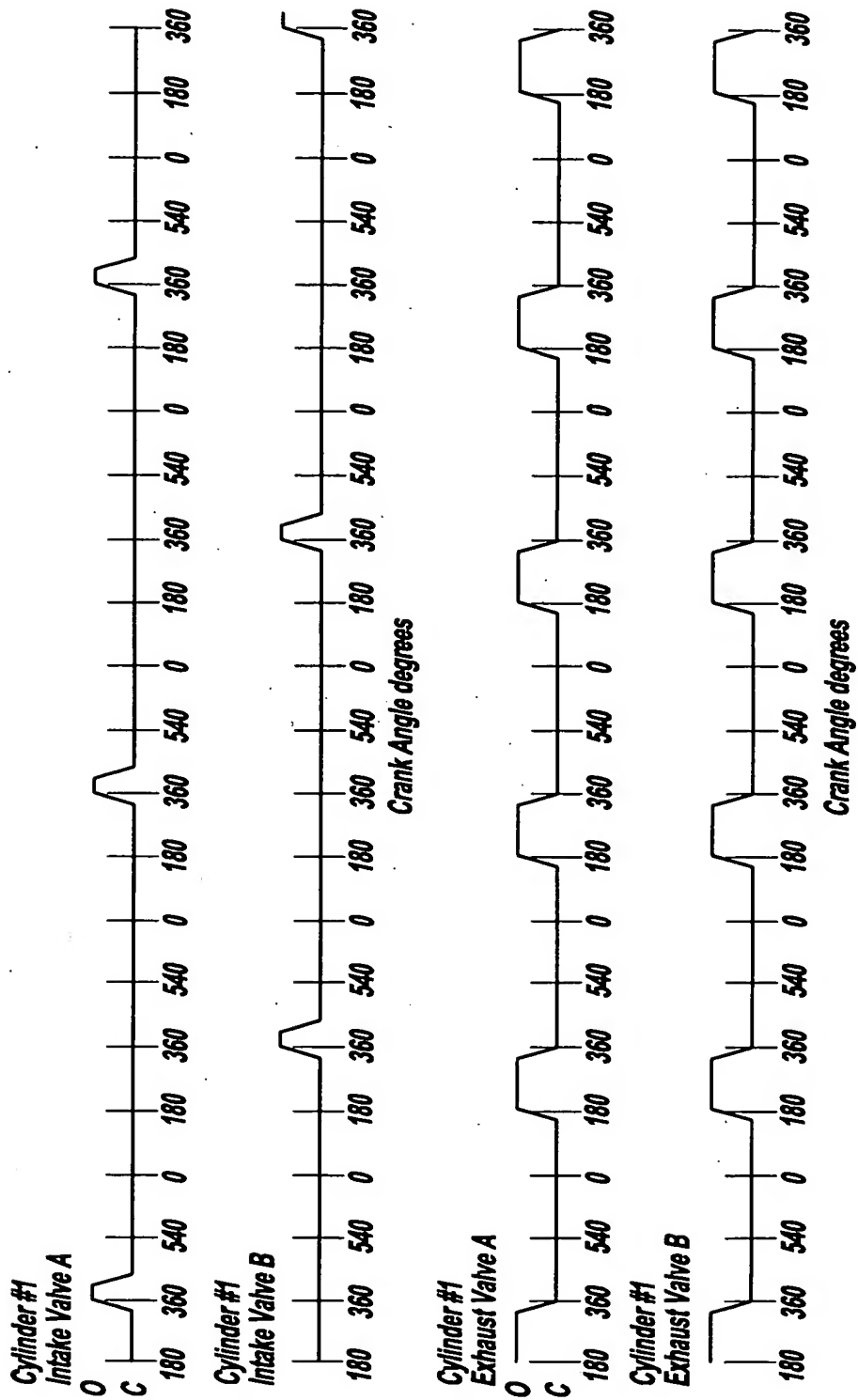


FIG - 43

**FIG - 44**

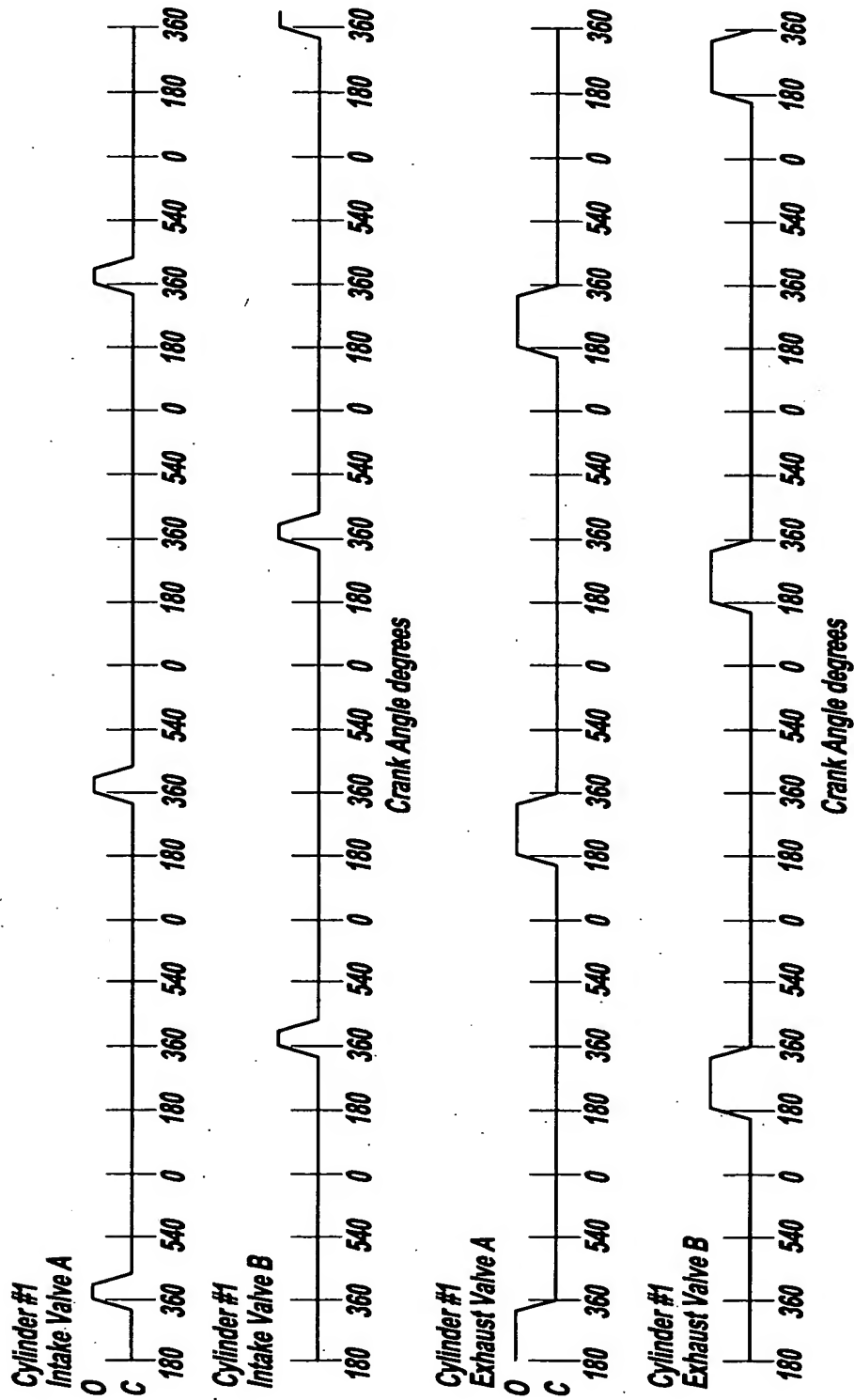


FIG - 45

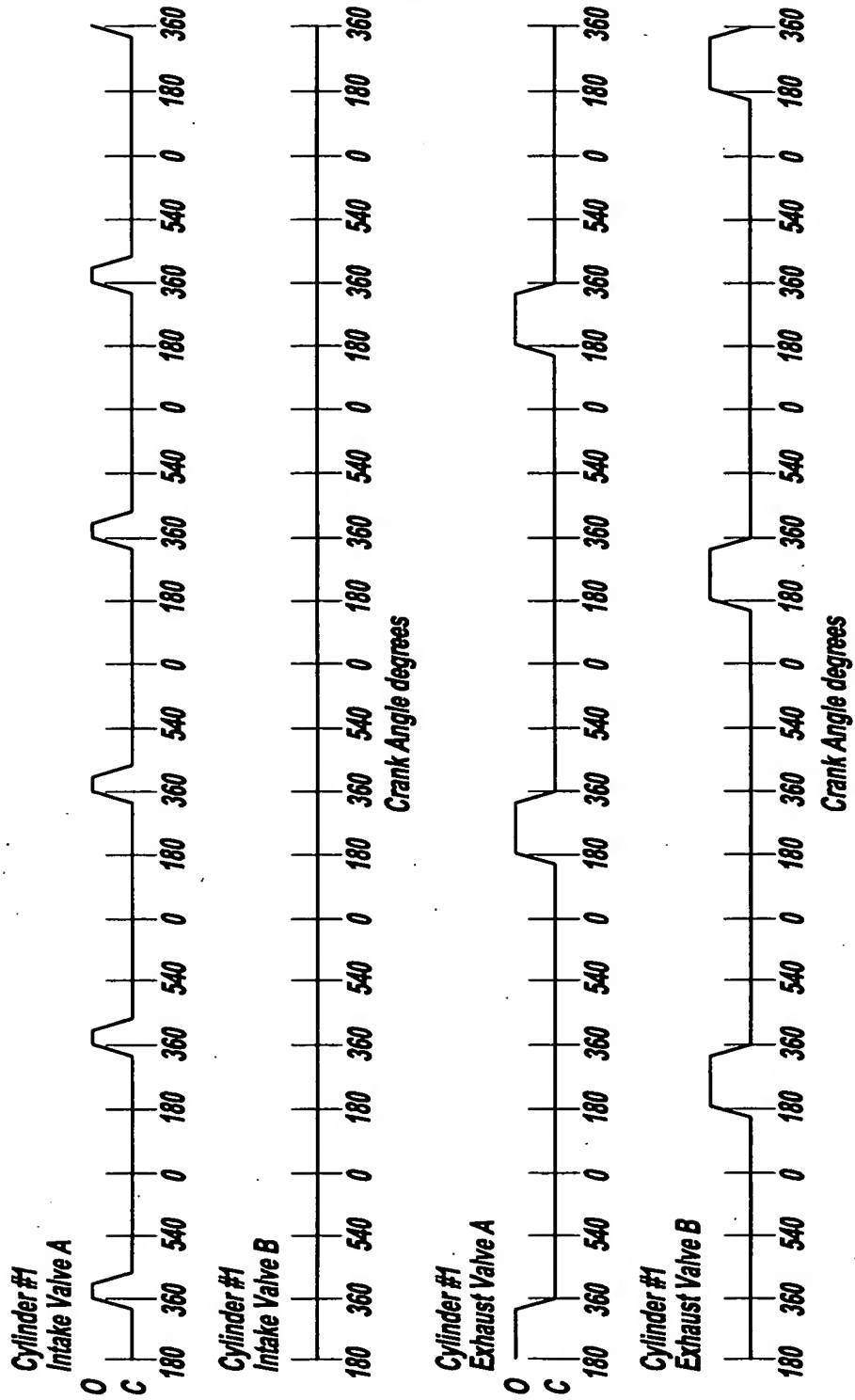
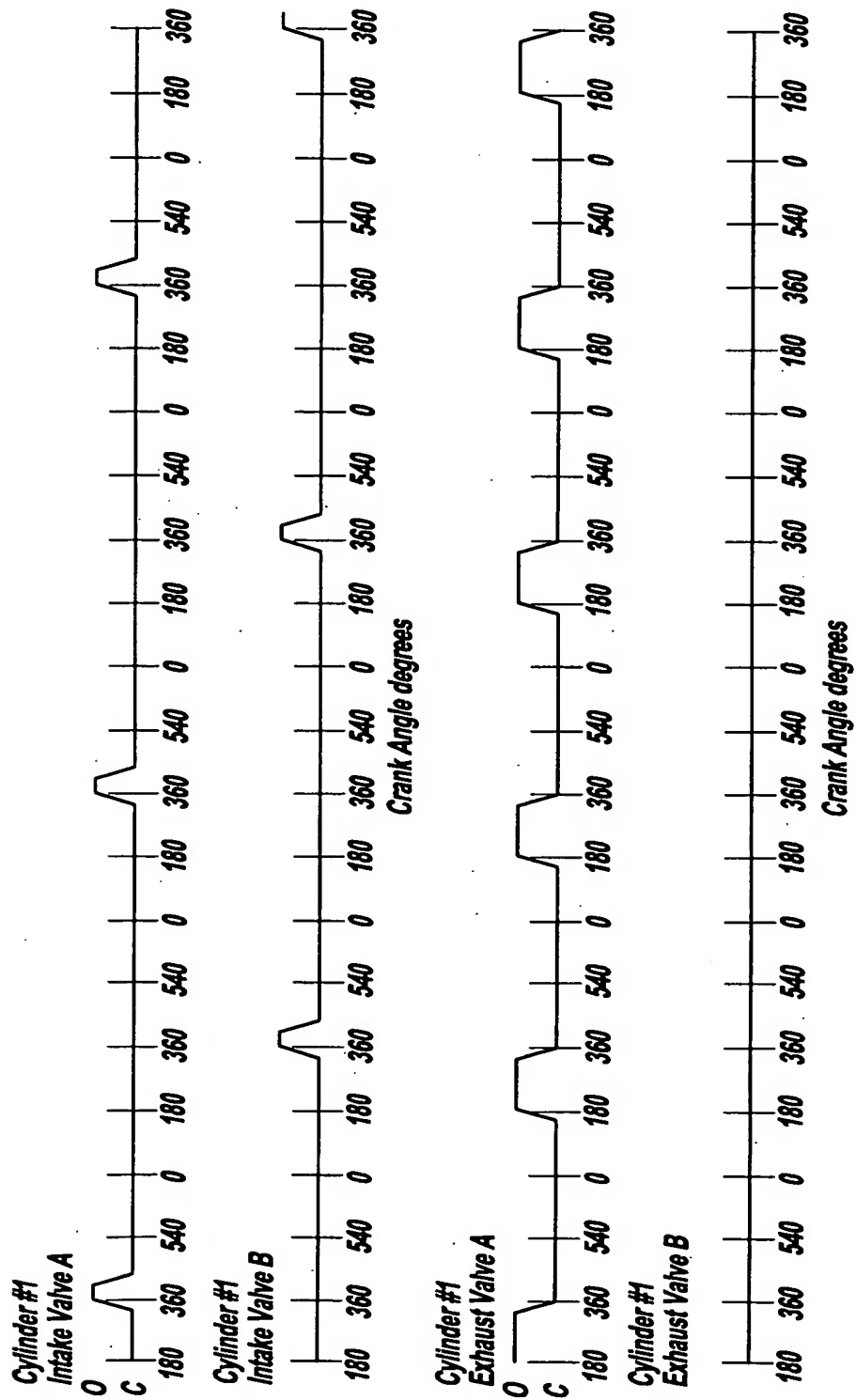


FIG - 46

**FIG - 47**

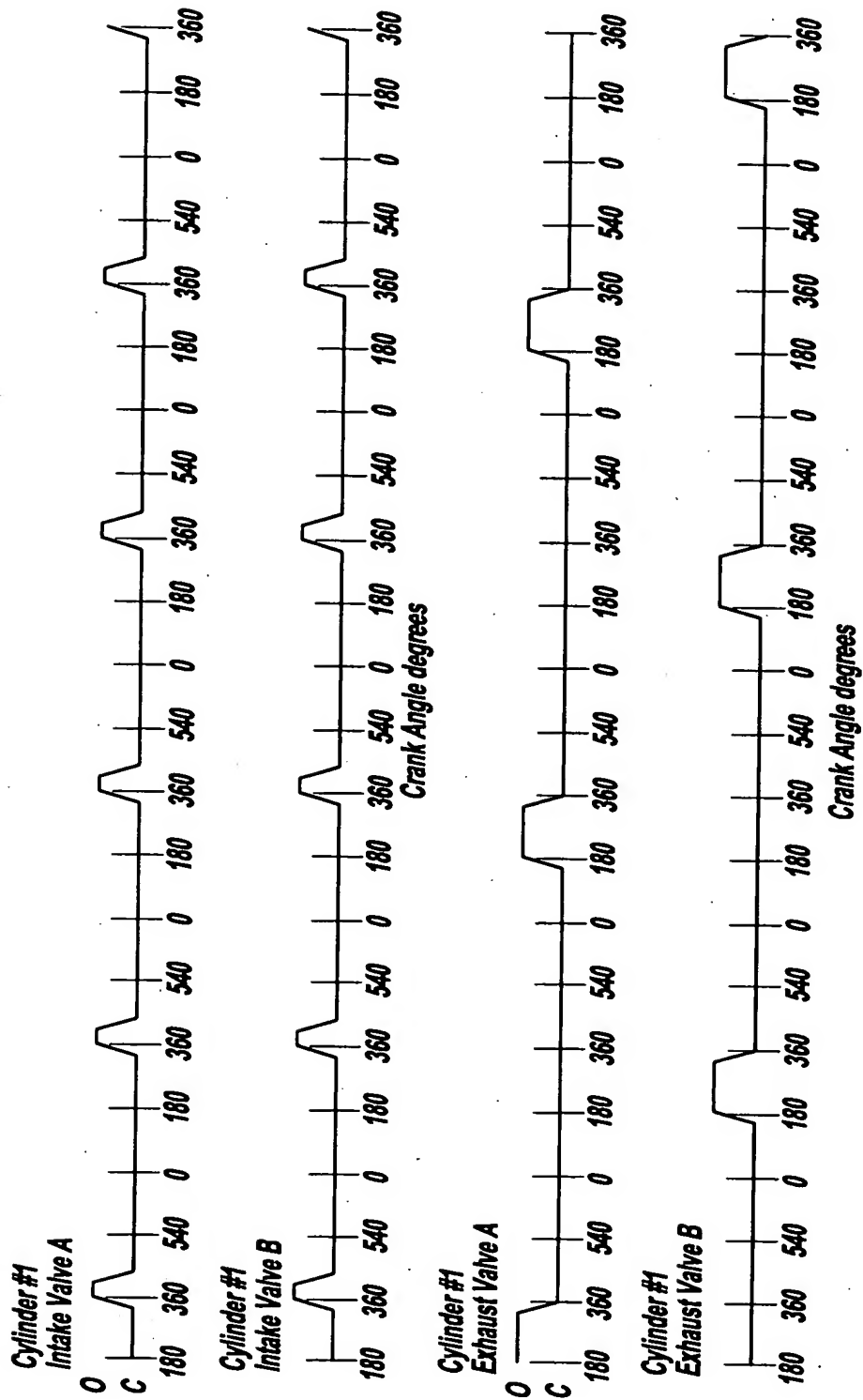
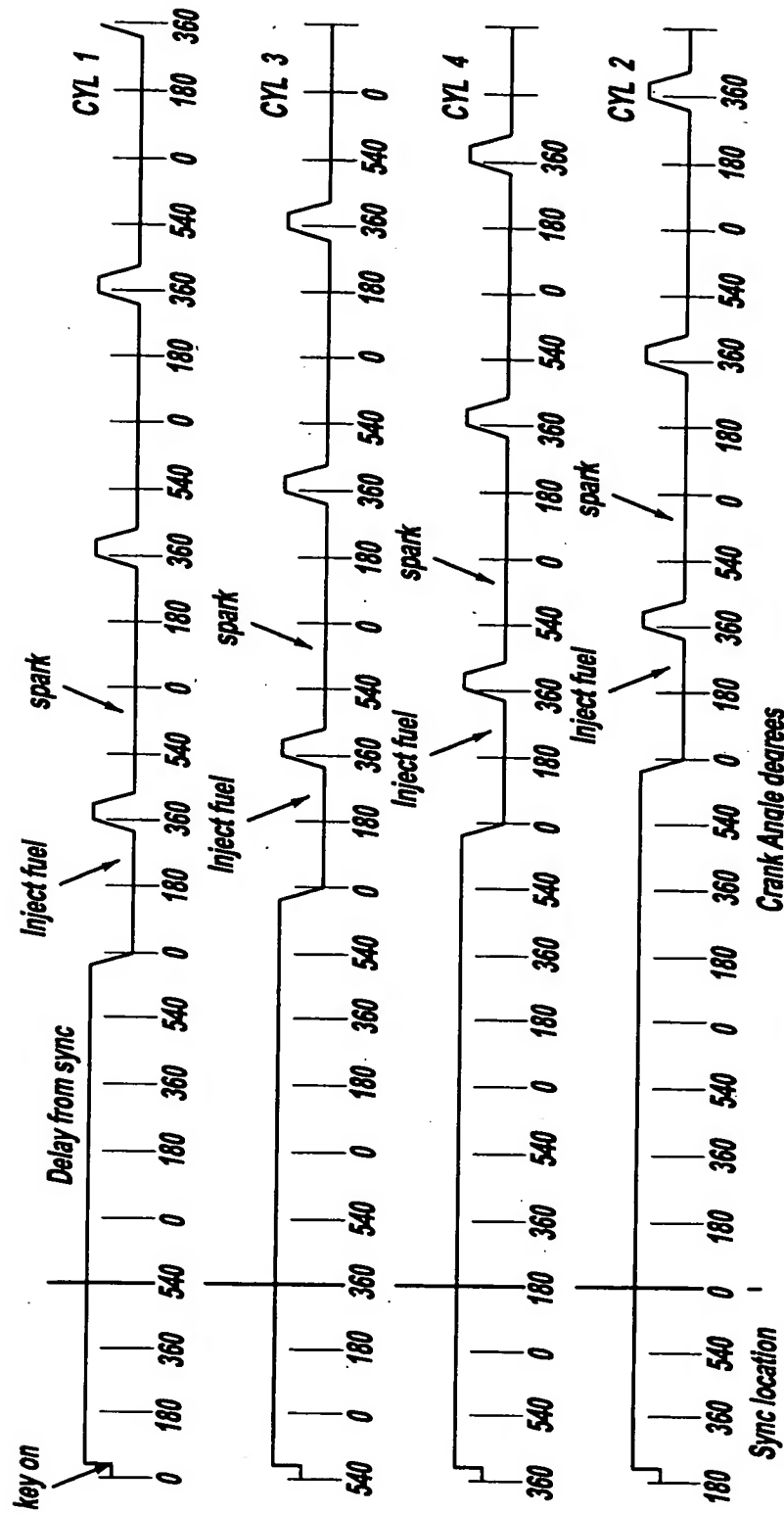
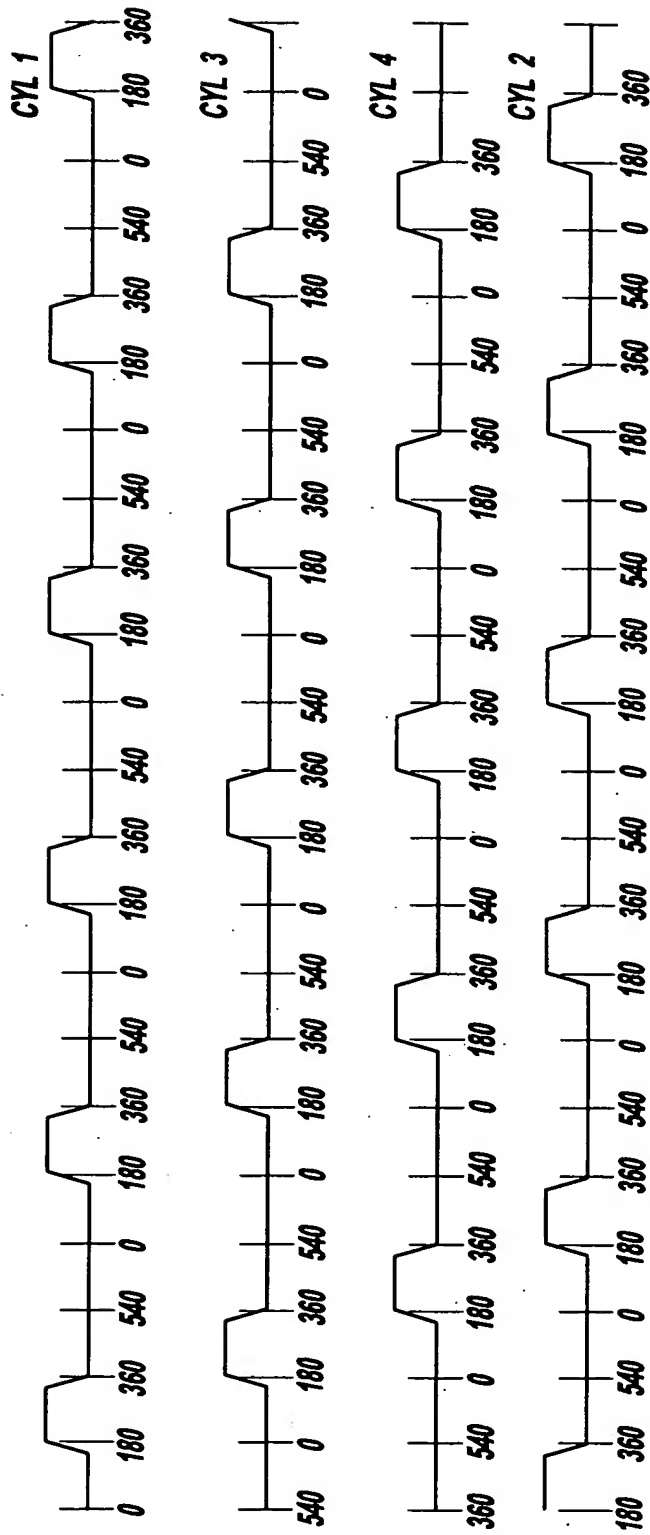


FIG - 48



Intake Valve Timing From Start (electrical valve operation)

FIG - 49a

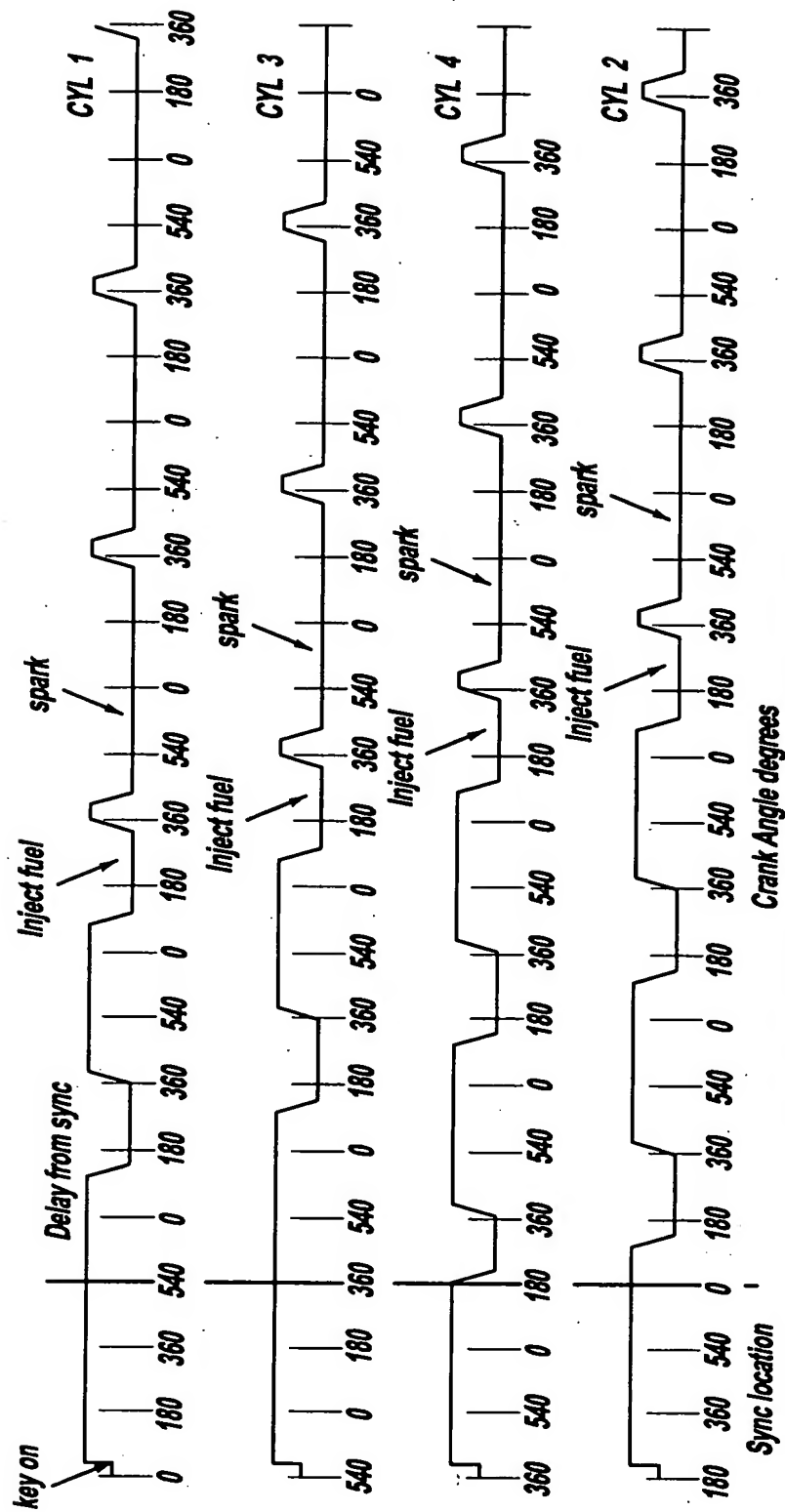


Crank Angle degrees
Exhaust Valve Timing From Start (mechanical valve operation)

Cylinder piston position cyl 1 & 4

Cylinders 2 & 3

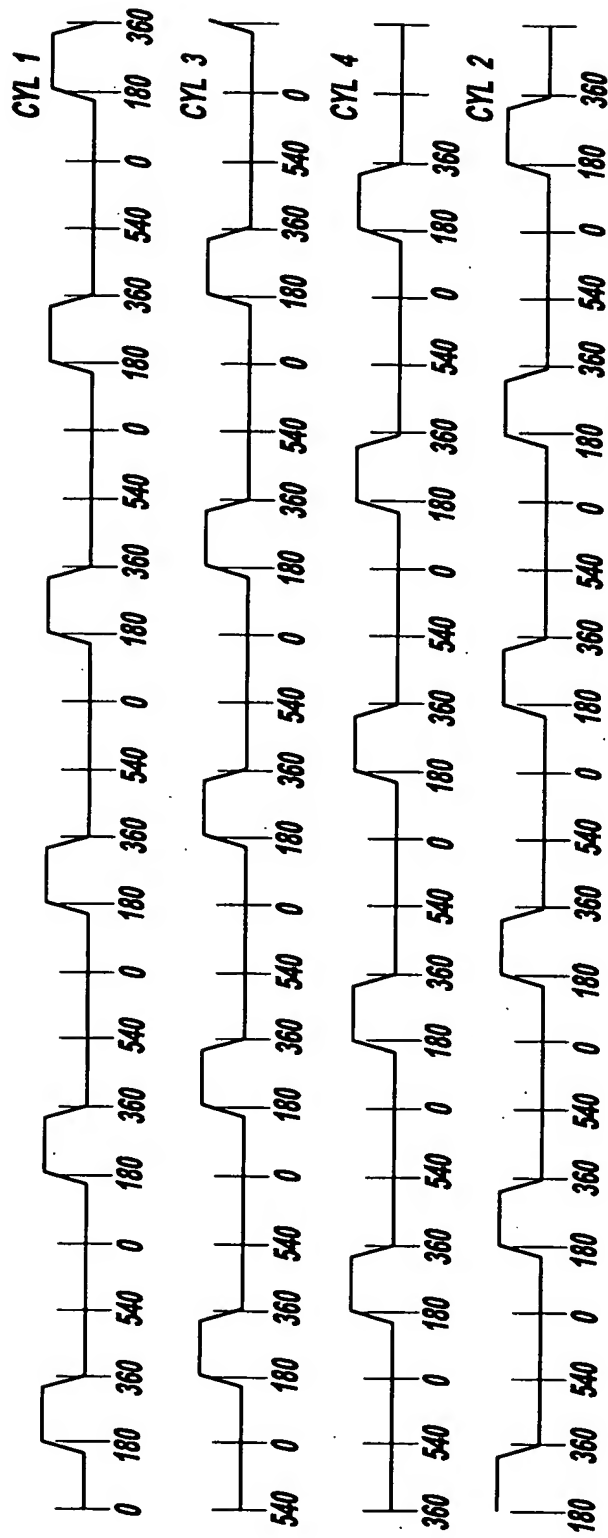
FIG - 49b



Crank Angle degrees

Intake Valve Timing From Start (electrical valve operation)

FIG - 50a

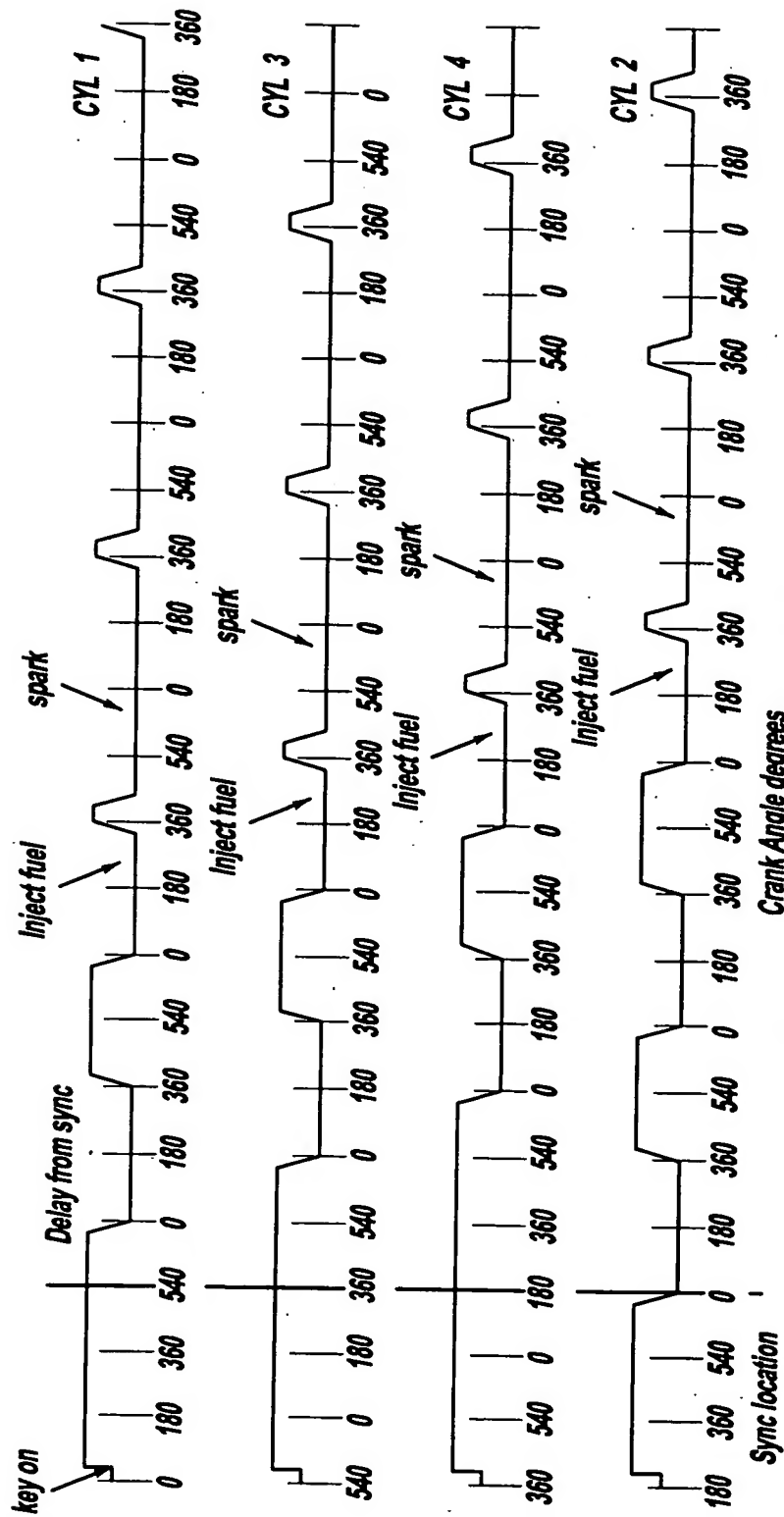


Crank Angle degrees
Exhaust Valve Timing From Start (mechanical valve operation)

Cylinder piston position cyl 1 & 4

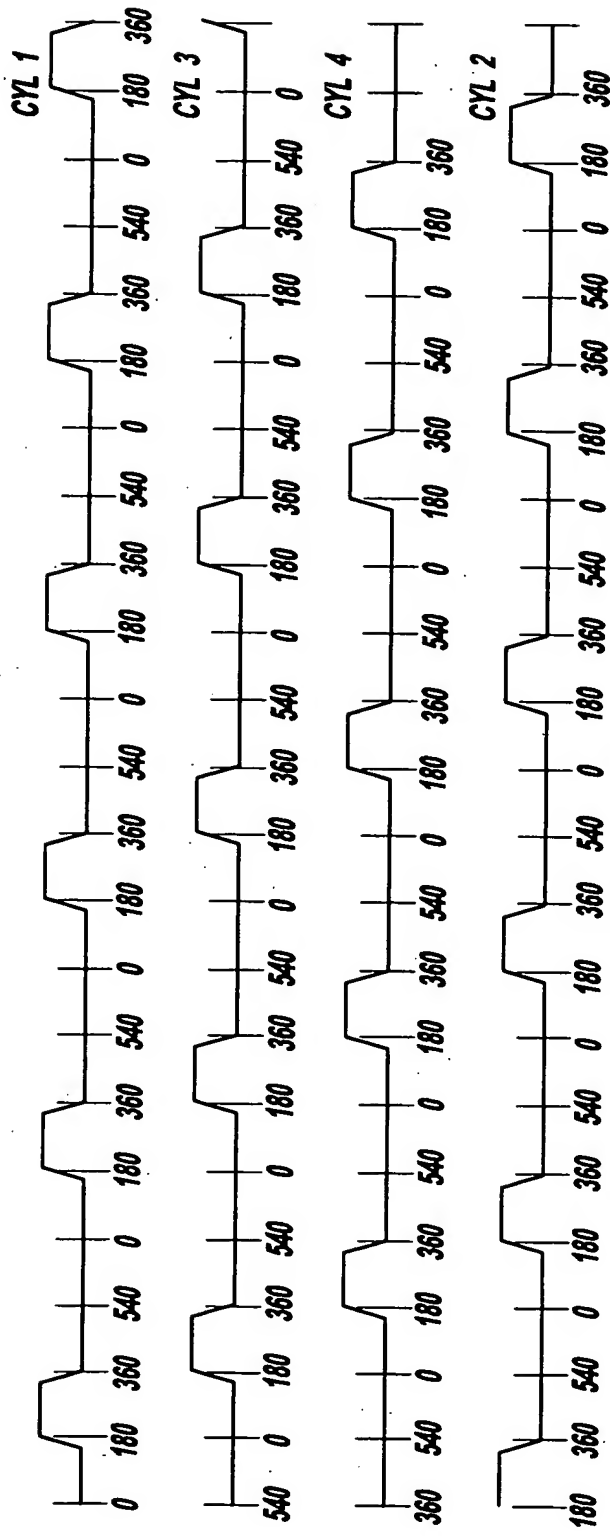
Cylinders 2 & 3

FIG - 50b



Intake Valve Timing From Start (electrical valve operation)

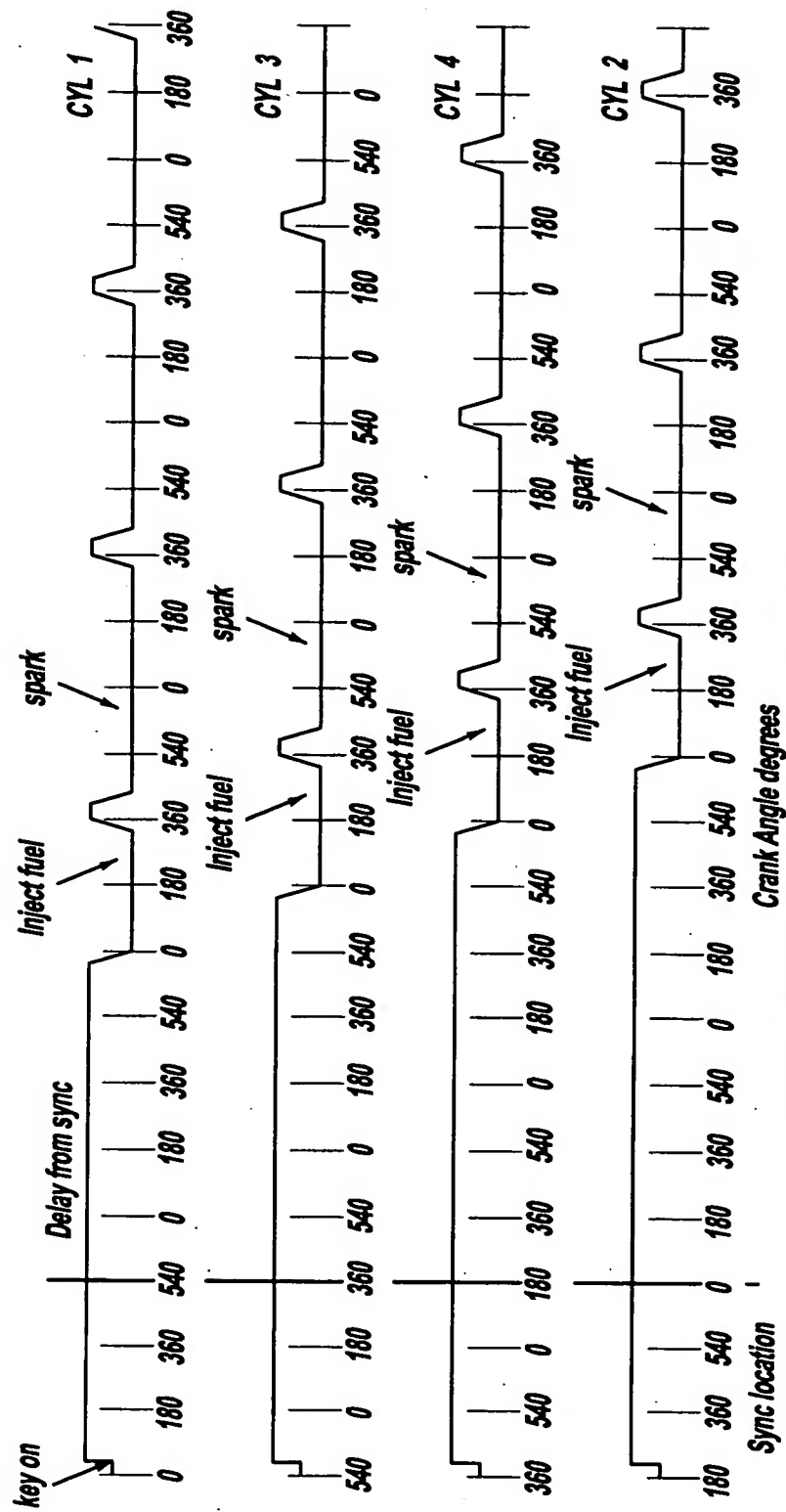
FIG - 51a



Cylinder piston position cyl 1 & 4

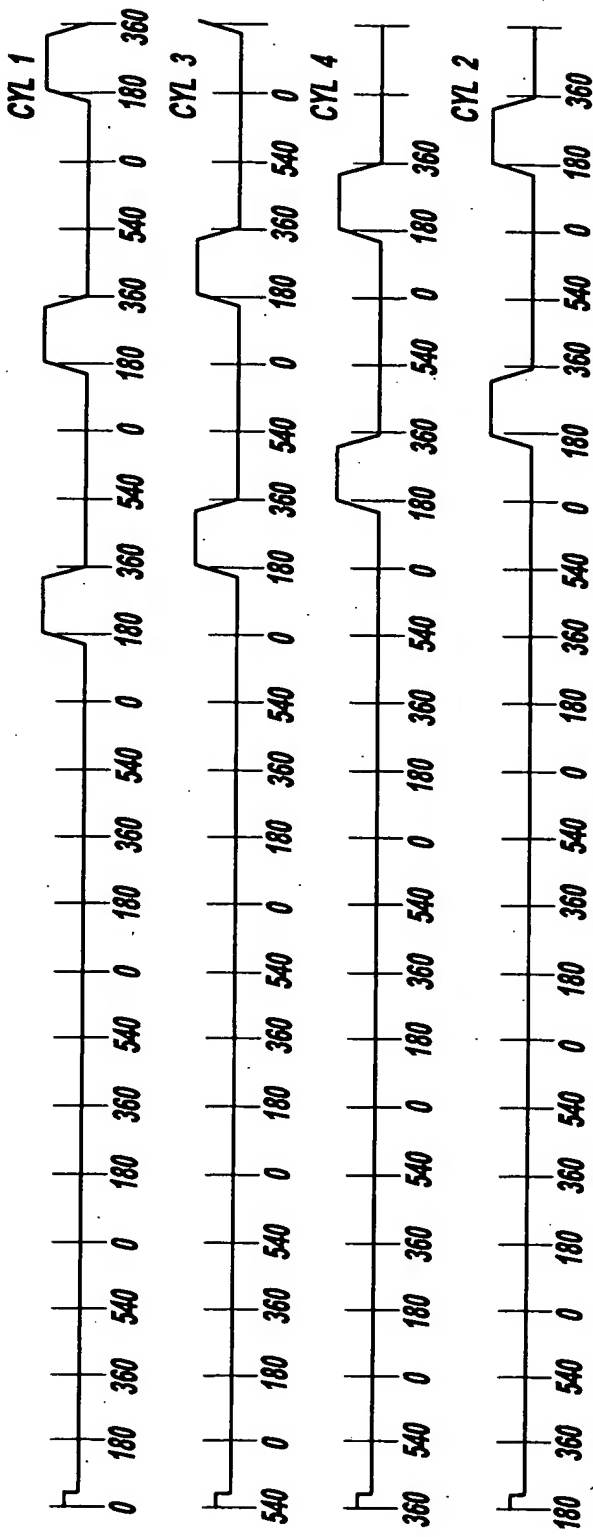
Cylinders 2 & 3

FIG - 51b



Crank Angle degrees
Intake Valve Timing From Start (electrical valve operation)

FIG - 52a



Exhaust Valve Timing From Start (electrical valve operation)

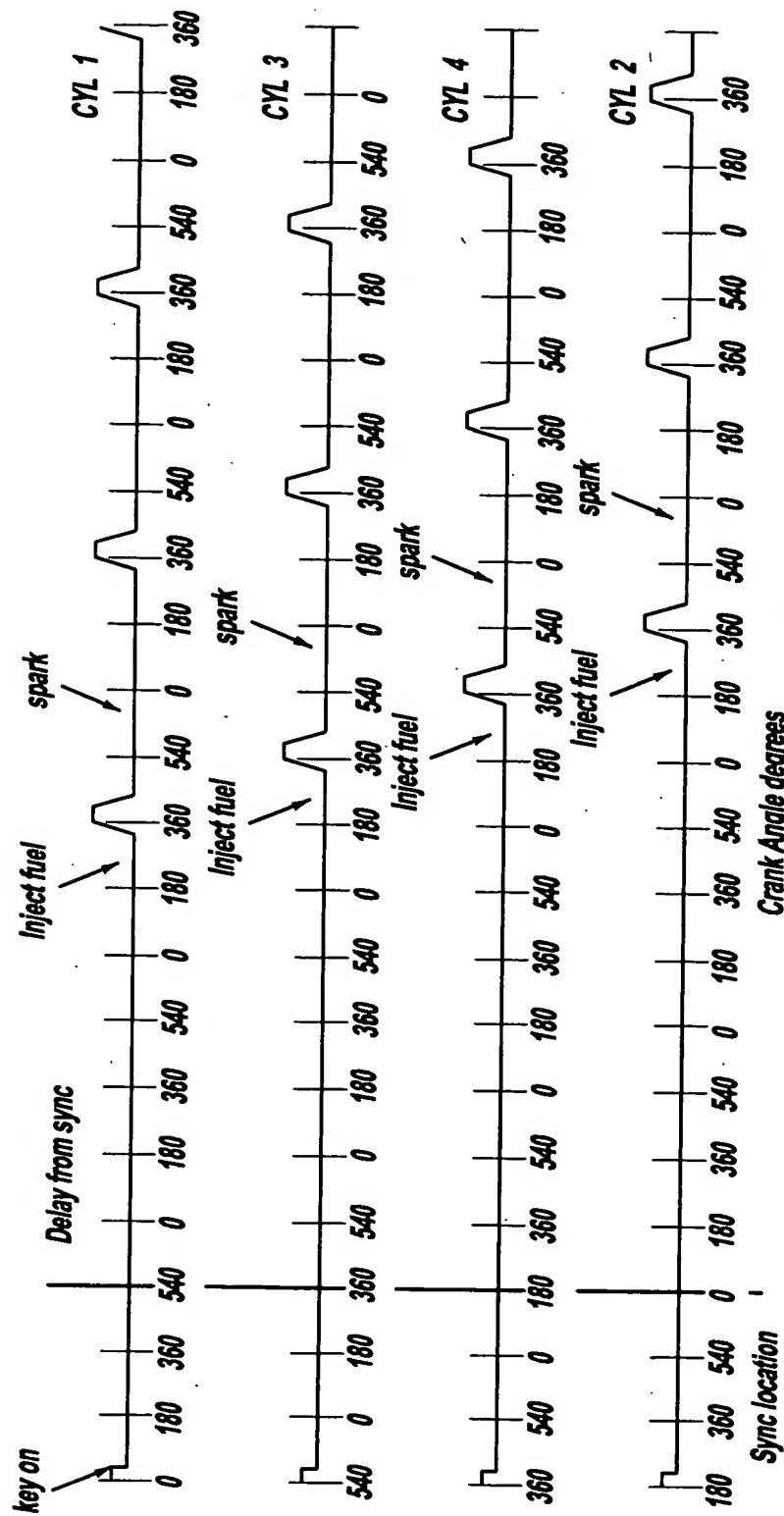
Cylinder piston position cyl 1 & 4



Cylinders 2 & 3

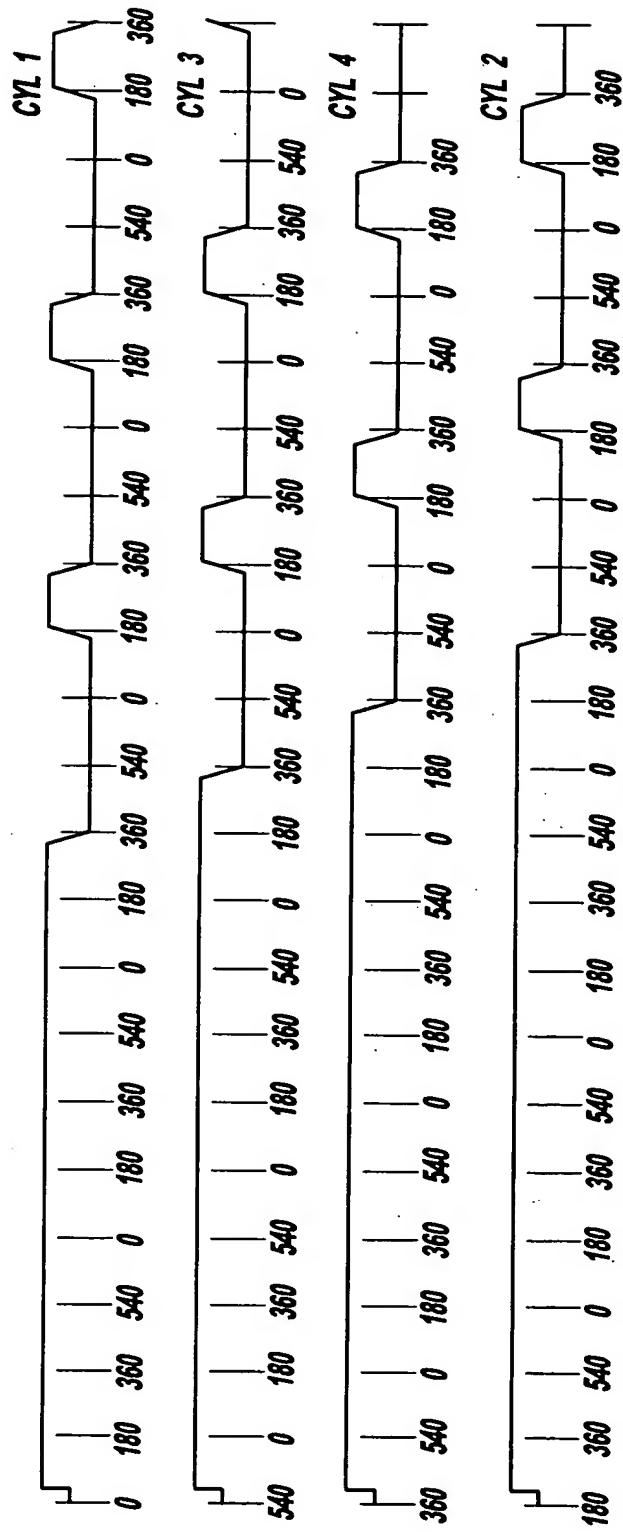


FIG - 52b



Crank Angle degrees
Intake Valve Timing From Start (electrical valve operation)

FIG - 53a



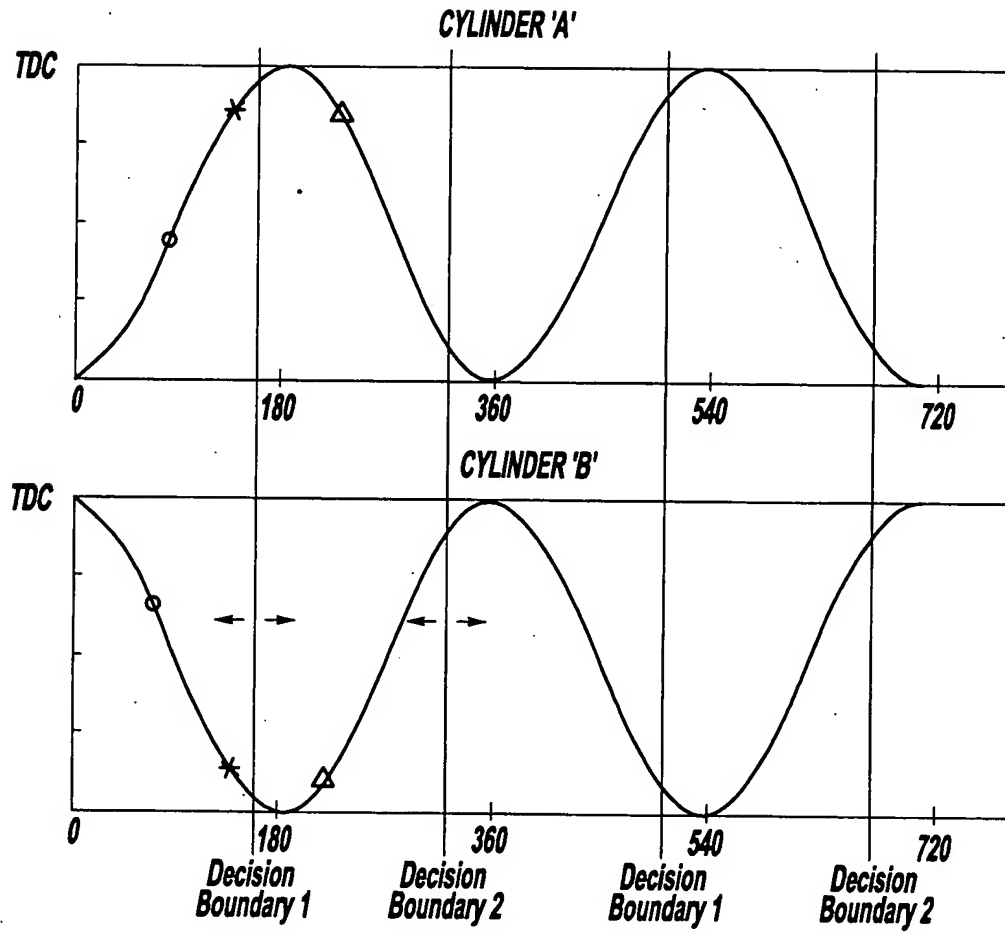
Crank Angle degrees

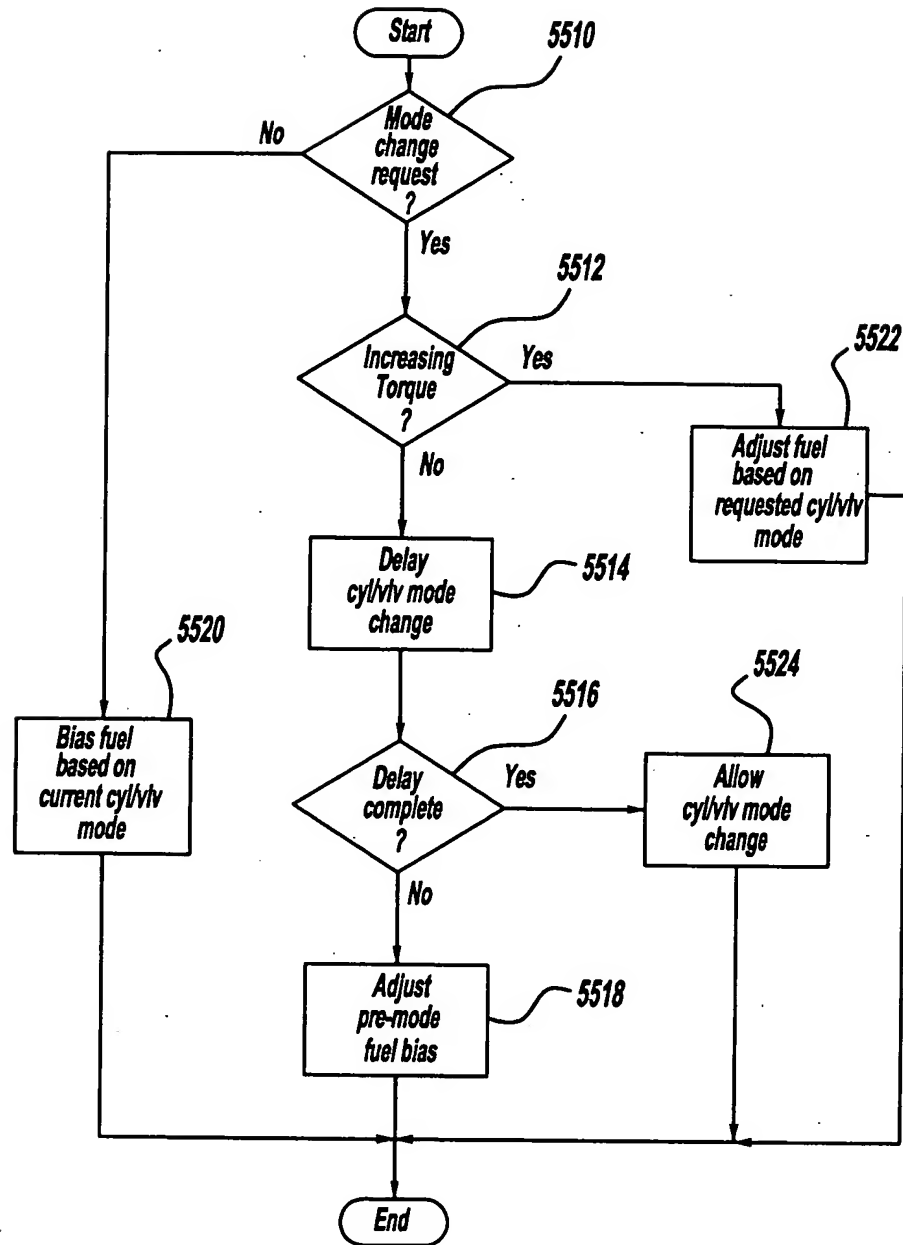
Exhaust Valve Timing From Start (electrical valve operation)

Cylinder piston position cyl 1 & 4

Cylinders 2 & 3

FIG - 53b

**FIG - 54**

**FIG - 55**